

U. S. DEPARTMENT OF AGRICULTURE.

REPORT

OF

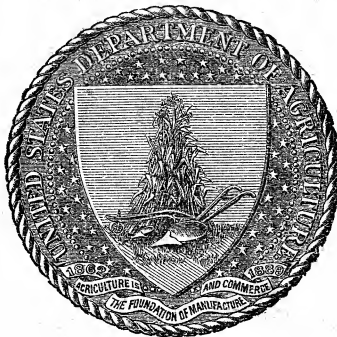
THE POMOLOGIST

FOR

1895.

BY

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LETTER OF TRANSMITTAL.

UNITED STATES DEPARTMENT OF AGRICULTURE,
DIVISION OF POMOLOGY,
Washington, D. C., November 20, 1896.

SIR: I have the honor to transmit herewith a report of the general operations of this division during the year 1895, comprising such topics as could not be appropriately included in the preliminary business report already made and published as a part of the executive report of the United States Department of Agriculture for the fiscal year 1895.

In addition to the general report of the division I have appended a brief article on "The Almond in Southwest Utah and Southeast Nevada," by Thomas Judd, of Utah.

The publication of this report in bulletin form is desirable for distribution to the regular correspondents of the division and to answer in the most comprehensive form the many requests for information upon various pomological subjects.

Very respectfully,

S. B. HEIGES,
Pomologist.

Hon. J. STERLING MORTON,
Secretary of Agriculture.

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REPORT OF THE POMOLOGIST FOR 1895.

WORK OF THE YEAR.

The special agent of this division, T. T. Lyon, of South Haven, Mich., has very largely completed the card list of pears, peaches, etc., with their various synonyms, reference being made in every instance to the various works on pomology and catalogues wherein the fruits are described. This work when completed will be a comprehensive and thorough authority on synonymy.

Two changes have occurred in the clerical and artistic force of the division during the year; one because of the resignation of A. N. Brown, on account of ill health, and the other through the death of W. H. Prestele, August 16, 1895.

Owing to the very valuable service rendered to pomology in the matter of illustrations of fruits, it is proper and just that there should be placed on record a tribute to the worth of Mr. W. H. Prestele. In the organization of this division by Professor Van Deman he was called at an early date to engage in the representation of fruits in water colors. Mr. Prestele was well and favorably known at that time as an expert artist in that line of work. During all the years that he was connected with this division he was faithful in the discharge of his duties and efficient in his work until his health became permanently impaired by paralysis, of which he died.

SPECIMENS FOR EXAMINATION AND IDENTIFICATION.

There were almost 3,000 receipts of fruits for examination and identification entered upon the journal during the year. Of these 120 were of a miscellaneous character and were referred for consideration to the divisions to which they related. There were 233 donations of scions or plants for propagation, which were sent to sections that were presumed to be best adapted for trial.

Of the 886 varieties received for identification, 595 were determined satisfactorily to ourselves, 123 were but negatively determined, and 186 were not recognized as among the named varieties.

Of 1,605 named varieties from growers and special investigators, 67, or over 4 per cent, were received under erroneous names.

MEANS FOR IDENTIFICATION.

There have been made during the year descriptive sheets of upward of 750 specimens of fruits in accordance with the plan adopted by the division; 206 models of fruits, closely following nature in color, dots, etc., and 195 paintings of entire fruits and sections.

GRAFTED TREES.

Upward of 2,000 seedling apple trees were grafted with scions of 29 varieties of apples received from Hungary. Three methods of grafting were used—whole root, upper cut, and lower cut. These trees have been cultivated by members of the division, and will be distributed at the proper time to such parties as will report upon the growth resulting from the different methods of grafting.

RECEIPT AND DISTRIBUTION OF SCIONS AND PLANTS.

Scions and plants were sent out for trial, mostly in sections where certain varieties appeared to be little known, for the purpose of introducing better varieties than had been received by the division from those sections and, in some instances, for grafting upon trees that produced fruit closely resembling the varieties sent, that a comparison of the fruits grown under similar circumstances might establish their identity or varietal difference. These scions and plants, aggregating 2,585 parcels, consisted of apple, plum, cherry, pear, almond, grape, persimmon, blackberry, raspberry, strawberry, junberry, mulberry, chestnut, and walnut, and were sent to 475 persons, including the horticulturists of experiment stations.

DISTRIBUTION OF STRAWBERRY PLANTS.

A distribution of several thousand plants was made to parties who had kindly contributed specimens of fruits, in sections in which it was believed they would most likely succeed. These plants were obtained from the horticulturist of the Department, having been taken from grounds assigned to the Division of Agrostology.

DISTRIBUTION OF CHESTNUT SCIONS.

A large distribution of scions of Paragon, Numbo, and Ridgely chestnuts was made to parties living in sections in which the native chestnut is indigenous, for the purpose of grafting these improved varieties on native stock. A circular letter containing explicit directions upon grafting the chestnut accompanied each lot of scions.

RECEIPT OF CHINESE PERSIMMON SCIONS AND SEEDS.

The scions of Chinese persimmons received were distributed, but, owing to imperfect packing in China, all failed to grow. Several hundred trees have been propagated from the seeds received at the same time as the scions, which will be distributed at the proper time. These persimmons are said to be from 8 to 12 inches in circumference and of superior quality.

EXPERIMENTS WITH VITIS VINIFERA.

Concerning the progress of the effort at growing varieties of *Vitis vinifera* in the open air in North Carolina, referred to in my report last year,¹ it should be said that Dr. C. J. Kenworthy, of Tryon, who is conducting the experiment, planted in the spring of 1895 one vine each of 18 varieties of the Persian grapes introduced by this division in 1890. To thoroughly test their adaptability to the climatic conditions of the region they were not sprayed during the two seasons 1895 and 1896. The delay in publication of this report enables me to say that Dr. Kenworthy reports in the autumn of 1896 that six Persian varieties—Paykanec Razukee, Dizmar, Black Shahanee, and the unnamed varieties, Nos. 21, 24, and 26 of the same importation—have survived. Five of these give promise of bearing fruit in 1897.

After a test of over 60 varieties of *Vitis vinifera* at Tryon, Dr. Kenworthy reports "the variety known as *Sauvignon jaune*" to be the only one free from disease, and expresses his intention to propagate and cultivate this variety to a larger extent in order to give it a thorough trial. He commends it as a superior table grape and not excelled for wine. He also reports Verdelho as very promising in his garden.

Mr. R. F. W. Allston, of the same place, reports that both he and the late Capt. E. B. Thomas have grown Black Hamburg in the open air with success by grafting on Niagara and protecting the vines by laying down and covering with several inches of soil during the winter. One vine grafted in the spring of 1894 and thus treated set fourteen good clusters in 1895. Six of these, which were bagged and allowed to remain, ripened perfectly and attained an average weight of 14 ounces. The same vines and others of Golden Chasselas on Niagara roots were left unprotected during the winter of 1895-96. Though apparently uninjured in the spring of 1896, they failed to produce fruit this season, but made a satisfactory growth of wood. It would therefore seem probable that winter protection will be necessary for *Vitis vinifera*, even in such peculiarly favored sections as that in which Tryon is located.

EXHIBIT AT ATLANTA EXPOSITION.

The exhibit of the division at the Atlanta Exposition was planned with the intention of informing fruit growers and the general public in regard to the selection of varieties of our various fruits suitable for planting in different portions of the country, and to correct the tendency toward the use of local synonyms by an exhibit of fruit models correctly named. This collection contained more than 1,300 specimens and was composed of those exhibited at the World's Fair in 1893, together with additional specimens made since that time. The nomenclature adopted was in strict conformity with the Rules of Nomenclature of the American Pomological Society.

¹ Report of the Pomologist, 1894, p. 9.

The process of modeling was illustrated by a series of molds and models in the progressive stages of completion, together with the more important implements and materials used in the manufacture of models.

On account of the interest in apple culture recently shown in the mountain region of the South Atlantic States an exhibit of specimens of fresh fruits of varieties suited to market culture in that region was shown. The principal varieties exhibited in this case were Ben Davis, Bonum, Grimes Golden, Paragon, Winesap, Yellow Newtown, and York, Imperial, the specimens of which were generously donated by correspondents of this division in Virginia, West Virginia, Tennessee, and North Carolina.

Specimens of a few choice varieties of chestnut and pecan were also shown through the generosity of correspondents in Pennsylvania, Delaware, Louisiana, and Texas.

Experiments in the preservation of fresh fruits by means of immersion in carbonic acid gas (CO_2) and in vapor of alcohol were begun, but were soon discontinued because of the variable temperature of the building.

To aid in correcting the erroneous impression that all the orange trees in Florida had been destroyed by the freezes of 1894-95 a series of live Hart Late orange trees of bearing age obtained from that State were shown. The crop of fruit and blossoms originally carried by the trees was supplemented by the addition of facsimile fruits and blossoms. During the entire period of the exposition this feature of the exhibit attracted much attention.

Native fruits were represented in the exhibit by a portion of the Munson collection of photographs of American grapes, and by water-color paintings of several species.

Specimen water-color paintings of fruits and sample sheets illustrating the methods of fruit description used in the work of the division were also shown.

THE FRUIT CROP OF THE YEAR 1895.

The most striking features of the season were the disappearance from the markets early in the year of citrus and other semitropical fruits formerly received in large quantities from Florida, the large crop of peaches marketed from the new orchard regions of the South Atlantic and Gulf States, the phenomenal yield of apples and pears in the middle Atlantic and Ohio Valley States, and the large crop of winter apples in the comparatively new fruit regions of the lower Missouri Valley.

CLIMATIC CONDITIONS.

The autumn of 1894 was characterized by mild, dry weather over most of the country. During October, November, and December the highest temperatures recorded during those months were noted at many

points, particularly in the interior. Late in December, 1894, as noted in the report of the Pomologist for that year,¹ a severe freeze inflicted serious injury on the citrus and other semitropical fruits of the Gulf States. The weather continued cold and dry over most of the country from January 1, 1895, until late in March, though in the Gulf region a mild period during late January and early February was followed by a second and more disastrous freeze on February 7 and 8. At about the same time tender tree fruits, including the peach, were injured in the Ohio and lower Missouri Valley regions. On the Pacific Coast vegetation came rapidly forward, and before the end of February almonds, peaches, and plums were in bloom in California over a range of 500 miles of latitude. Late in March a few days of high temperature brought vegetation rapidly forward east of the Rocky Mountains, while on the Pacific Slope successive frosts did considerable damage to the early blooming kinds of deciduous fruits. April witnessed favorable weather except that the rainfall was deficient everywhere but in the South Atlantic States. During May, the month of bloom in the great orchard regions of the Middle and Northern States, the weather was, in the main, unfavorable to a large crop of fruit. Extremes of heat and frost, interspersed with periods of cold and rainy weather, conspired to prevent the proper fertilization of blossoms in many sections and, in combination with other causes, resulted in a heavy "drop" of immature fruit later in the season. Not all fruits in any one section were thus injured, however, and in most sections fair or even large crops of some fruits were harvested.

Except in the South Atlantic States, the summer and autumn were very dry, and in most sections exceptionally hot, especially during August and September. Beginning with October, cooler and more seasonable weather was experienced. During November the protracted drought was broken by heavy rains, which in many sections continued till the close of the year.

Late in December a freeze occurred in southern California which greatly reduced the crop of citrus fruits then being marketed. For a time it was feared that the trees had been injured; but later developments demonstrated that aside from the partial destruction of the crop of fruit then on the trees little damage was done.

APPLES.

The season opened with the promise of an enormous crop of this fruit, but owing to the unfavorable weather in May and the protracted drought during July, August, and September the yield was not large in the great northern apple belt. In that region, which includes the New England States, New York, and Michigan, the quality of the winter fruit was impaired by scab and insect injury. But the shortage in the North was largely made up by the large crop of winter fruit in the

¹Report of the Pomologist, 1894, p. 16.

Atlantic States from New Jersey and Pennsylvania southward and in the valleys of the Ohio and Missouri rivers.

In these, the regions where York Imperial, Winesap, and Ben Davis are the leading varieties, the quantity of the crop was large and the quality excellent. A considerable proportion of the total yield in these regions was hastened in its maturity by the prevailing drought. Much of this prematurely ripened fruit was fed to stock, made into cider, or left to rot in the orchards, owing to the glutted condition of the markets during autumn and early winter. The utilization of cold-storage establishments, which are now available in all the larger cities and in many of the smaller towns, unquestionably prevented a most disastrous collapse of prices by affording a means for the withdrawal of a considerable proportion of the supply of fruit from the markets until the poorer fruit had been disposed of, thus distributing the supply over a comparatively long period for consumption. It was estimated by the statistician of one of the leading fruit trade organizations that the total yield of apples in the United States during 1895 was in excess of 65,000,000 barrels, and by the secretary of another that there were at one time early in December over 1,000,000 barrels of apples in common and cold storage. Early in the season apples sold at very low prices, but the stored fruit, when disposed of later in the season, brought good and in many cases high prices. While most of the stock thus held was in the hands of dealers and speculators, to whom accrued the larger portion of the profits that ensued, there were some notable instances where individual growers stored their own product and profited largely by doing so. It is probable that a repetition of the climatic and crop conditions of the fall of 1895 will witness the storage by the growers of a considerable quantity of this fruit for marketing during the late winter and spring.

PEARS.

The yield of pears was large over most of the eastern United States. As was the case in 1894, the supply of Bartletts for a time greatly exceeded the profitable demand, and prices ruled very low. There is little prospect that the fruit of this variety can be profitably held in cold storage for any considerable time, owing to its rapid deterioration in flavor when thus stored. The only remedy in sight is the conversion of a portion of the younger and more thrifty Bartlett trees now planted into earlier and later ripening varieties by top grafting and the planting of such varieties when new orchards are set out. In this way only can a proper distribution of the crop through the season be accomplished and pear growing again be put upon a profitable basis. The varieties to be selected will of necessity be such as are suited to local conditions, but they should be selected with a view to securing productive varieties of bright color and good quality, known to be resistant to blight or at least not specially susceptible to that disease. In the South, Le Conte and Kieffer are, without doubt, the most profitable varieties grown at

the present time, but it is a matter of grave doubt whether the limit of profitable planting of these varieties is not near at hand. Save for cooking, neither of them is of sufficiently high quality to stimulate the appetite of the consumer and lead him to increase his purchases. The need of the orchardist is a series of varieties ripening in succession, which shall combine the vigor of growth, resistance to blight, and abundant productiveness of the Oriental type with the later blooming habit and more delicate texture and flavor of our common pears.

In view of the marked progress in the development of this fruit within the memory of men yet living, it seems not too much to hope that this end shall be soon attained by some of our numerous experimenters. The following varieties may be regarded as worthy of trial for lengthening the season of marketable pears: Earlier than Bartlett—Summer Doyenne, Giffard (should be top grafted on strong stocks), Rostiezer, Clapp Favorite; later than Bartlett—Louise Bonne (de Jersey), Claireau, Lawrence, and Winter Nelis.

STONE FRUITS.

Of the stone fruits the peach easily leads in importance in the United States. The yield of this fruit in the new orchard regions of Georgia was the largest thus far sent to market. More than 900 carloads were shipped from that State during the season. On the Chesapeake Peninsula a large prospective yield was considerably reduced by a heavy June drop, but a crop of at least average size was nevertheless marketed. In New Jersey, New York, and New England the crop was large, as it was also in northern Ohio and Michigan. The crop in the last-named State approximated 1,000,000 bushels. In the Ohio Valley peach district, which includes portions of southern Ohio, Indiana, and Illinois and northern Kentucky, the yield was light, owing to winter injury to the fruit buds. The crop was not heavy in the Ozark region of southwestern Missouri. In California the yield was less than for several years previous, owing to the spring frosts elsewhere referred to; but there was a supply sufficient to meet the demands of the markets during most of the period when this fruit is in season.

Plums were in large supply in the Eastern districts that produce this fruit. On the Pacific Slope the yield of dried prunes was estimated at over 60,000,000 pounds. Though this is a larger quantity than was produced in 1894, it is not up to what may now be expected of the orchards of bearing age in that region when a full crop shall be harvested. Apricots and cherries were in rather short supply from the Pacific Coast, the quality of both being excellent, however. In the East the cherry crop was abundant.

GRAPES AND SMALL FRUITS.

The hard frosts during May were at one time thought to have ruined the crop of table grapes in the vineyard regions from northern Ohio eastward, but the final summing up of the harvest showed the largest

crop ever marketed, it being estimated that 3,000 carloads were shipped from the central New York grape region alone. Prices ruled very low during most of the season. The grape crop of California was larger than that of the previous year, the raisin product alone being estimated at over 100,000,000 pounds.

In consequence of the February freeze in the Gulf States and Florida the supply of strawberries early in the season was very light in Northern markets, and in the interior this scarcity was prolonged by drought, which set in early in May throughout the Mississippi Valley. For the first time strawberries from the Pacific Coast became a factor in the markets of the cities east of the Rocky Mountain States, carload lots having been profitably shipped from California and Oregon to points as far east as Chicago. In the last-named city carload shipments of strawberries in good condition were on the market at the same time from points as far west as Oregon and as far east as Oswego, N. Y., a fact which clearly illustrates the possibilities of modern methods of fruit transportation.

The bush fruits, which are most largely grown north of the Potomac, the Ohio, and the Arkansas rivers, were very much reduced in yield by the drought.

Cranberries yielded a sufficient quantity for the home demand, in addition to a limited quantity marketed in Europe as the result of efforts on the part of growers to stimulate an export demand for this fruit.

TROPICAL AND SEMITROPICAL FRUITS.

With the exception of the pineapple, the fruits grouped under this head were little better than a total failure in the southern United States in 1895. The freezes of December 28, 1894, and February 7-8, 1895, not only destroyed the fruits then maturing, but in most of the orange and lemon growing districts killed the trees to the ground.

The only marked exception was that portion of Florida lying south of latitude 27°, though in a few localities farther north water or forest protection prevented serious injury to the more hardy species.

The orange crop of Florida, which was estimated at 5,000,000 boxes in 1894, was reduced to less than 75,000 boxes in 1895, while the yield of pomelos and lemons was insignificant as compared with the crops of former years. The growers, who were at first very much disheartened by the disastrous effect of the freeze, were encouraged by the rapidity with which the blackened stumps were hidden by new sprouts from below the point of injury, and have in the majority of instances begun the restoration of their groves. At the same time, the planting of the orange, lemon, and pomelo is being pushed farther to the south wherever suitable land is found. It now seems entirely probable that within a very few years these fruits will again be abundantly marketed from Florida. Meanwhile the peach, plum, strawberry, grape, pineapple, and

other fruits are receiving much more attention, and a diversity of products never before produced commercially in that section is the beneficial result.

The limited number of orange trees in Louisiana and Texas were killed to the ground or badly injured in February, 1895. In Louisiana the groves are being rapidly restored, but in Texas it is unlikely that orange growing will again be attempted on a commercial scale in many years.

The California orange crop of 1895-96 promised to be the largest ever produced in that State, but was reduced about one-third by the freezes late in December, 1895, to a quantity somewhat less than that of 1894-95. The crop of that year excelled all expectations, and amounted to over 2,100,000 boxes.

The yield of lemons in California in 1895 was larger than ever before, and was estimated at 150,000 boxes.

The pineapple yield in Florida, the only State which produces this fruit in commercial quantities, was reduced to about one-fifth of that of the previous year, but the plants have so promptly recovered and the newly planted area is so great that the largest yield of this fruit ever produced in the United States may reasonably be looked for within the next year or two.

A comprehensive account of the effects of the freezes on various tropical and semitropical fruits grown in Florida may be found in the Yearbook of the Department for 1895.¹

Olive culture, which has for some years been rapidly extending in California, reached important commercial dimensions in 1895, the product of olive oil alone in that State during the year being estimated at 15,000 gallons. A rapid annual increase in this crop is now probable.

NUTS.

The crop of almonds was light, while that of Persian walnuts (*Juglans regia*) was above the average. An increased interest in the production of these nuts is manifest on the Pacific Slope. For the first time in the history of the nut industry in this country almonds were shelled near the point of production and shipped in the form of meats. A car load of such meats, packed in 25-pound boxes, shipped from the Hatch orchards in California, sold for good prices in New York. The chief advantage gained is in the saving of freight on the shells, which frequently constitute two-thirds of the gross weight of the nuts as commonly shipped. The shelling is done by machinery. The crops of native chestnuts and pecans were large and the nuts were of fine quality, while the yield of shellbarks was comparatively small. A considerable quantity of chestnuts was marketed from the grafted orchards now coming into bearing in some of the Eastern States.

¹"The two freezes of 1894-95 in Florida and what they teach," by Herbert J. Webber, Yearbook of Department of Agriculture, 1895, pp. 159-174.

IMPORTS AND EXPORTS OF FRUITS AND NUTS.

Imports of fruits and nuts showed a slight decrease as compared with 1894, and were much less than 1891, 1892, or 1893. The values of the imports for the five years were:

Imports of fruits and nuts, 1891-1895.

1891	\$21, 714, 685
1892	22, 210, 317
1893	20, 920, 925
1894	18, 088, 839
1895	17, 945, 455

The chief items of increase and decrease in imports in 1895 as compared with 1894 are shown in the following table:

Imports of fruits and nuts, 1894 and 1895.

Items.	1894.		1895.		Increase (+) or de- crease (-).
	Quantity.	Value.	Quantity.	Value.	
Fruits:	<i>Pounds.</i>		<i>Pounds.</i>		
Bananas		\$4, 960, 727		\$4, 533, 621	—\$427, 106
Currants (dried grapes)	34, 558, 828	442, 172	29, 806, 120	478, 545	+ 36, 373
Dates	16, 435, 808	373, 257	12, 823, 118	228, 756	— 144, 501
Figs	10, 653, 016	549, 469	13, 440, 604	698, 894	+ 149, 325
Lemons		4, 272, 029		4, 080, 897	— 191, 132
Oranges		1, 088, 288		2, 830, 330	+ 742, 042
Plums and prunes	14, 641, 041	527, 134	3, 963, 007	168, 656	— 358, 478
Raisins	15, 889, 517	647, 403	10, 429, 642	445, 082	— 202, 321
Prepared or preserved fruits		545, 515		619, 200	+ 73, 685
All other fruits		2, 425, 141		1, 942, 138	— 483, 003
Total		15, 831, 135		16, 026, 119	+ 194, 984
Nuts:					
Almonds	9, 210, 759	905, 297	6, 814, 838	670, 016	— 235, 281
Cocoanuts		626, 183		493, 865	— 132, 318
All other nuts		726, 224		755, 455	+ 29, 231
Total		2, 257, 704		1, 919, 336	— 338, 368
Total fruits and nuts		18, 088, 839		17, 945, 455	— 143, 384

It will be noted that the principal items of increase were: Figs, \$149,325, and oranges, \$742,042. The increase in the latter item is traceable solely to the destruction of the Florida crop.

The important items showing decrease were: Bananas, \$427,106; plums and prunes, \$358,478; raisins, \$202,321, and almonds, \$235,281. Most of these items of decrease were in some degree due to short crops in the countries from which the fruits mentioned are imported. The prune crop of Europe was very light, and a small export trade in the California article was begun which promises to become important in future years.

Of the fruits and nuts imported in quantities sufficiently large to be separately mentioned in the table, only bananas, dates, and cocoanuts are unsuited by their climatic requirements to large production in the United States. Deducting the combined value of these three items (\$5,256,242) from the value of the fruit and nut imports of the year, we

have \$12,689,213 as a home-market incentive to American fruit growers to increase their production of the various fruits now imported which can be successfully grown within our borders. The items of chief importance comprised within this sum are lemons, oranges, figs, almonds, "currants" (dried grapes), raisins, and prunes. With several of these items, particularly figs and raisins, the quality of product is of great importance—experience in selection of soil and varieties, methods of cultivation, irrigation, curing, and packing being the essential points in their production. These demand thorough investigation in the districts believed to be best adapted to the production of the respective fruits, and doubtless in the countries from which we now import them.

Our fruit exports showed a gratifying increase over those of the previous four years. The totals for five years are shown in the following table:

Exports of fruits and nuts, 1891-1895.

1891	\$5, 336, 603
1892	4, 980, 943
1893	2, 701, 525
1894	4, 427, 481
1895	5, 450, 877

The exports for 1894 and 1895 are shown in the following table, together with amounts of increase or decrease:

Exports of fruits and nuts, 1894 and 1895.

Items.	1894.		1895.		Increase (+) or decrease (-).
	Quantity.	Value.	Quantity.	Value.	
Fruits:					
Apples, driedlbs..	5, 309, 293	\$338, 869	19, 330, 943	\$1, 039, 738	+ 700, 869
Apples, green or ripebbls..	675, 996	1, 624, 272	451, 894	1, 111, 529	- 512, 743
Total apples		1, 963, 141		2, 151, 267	+ 188, 126
Preserved:					
Canned		809, 425		1, 349, 740	+ 540, 315
Other		109, 784		66, 342	- 43, 442
All other, green, ripe, or dried		1, 415, 285		1, 778, 303	+ 363, 018
Total fruits		4, 297, 635		5, 345, 652	+1, 048, 017
Nuts		129, 846		105, 225	- 24, 621
Total fruits and nuts		4, 427, 481		5, 450, 877	+1, 023, 396

It will be observed that there were large increases in the exports of dried apples, \$700,869; canned fruits, \$540,315, and in the group "all other, green, ripe, or dried fruits," \$363,018, while there was a marked decrease in the export of "apples, green or ripe," \$512,743. The decrease in fresh apples was doubtless mainly due to the fact that the crop of summer and fall apples in Europe was exceptionally large in 1895. This fact caused very light shipments from this country and British North America until comparatively late in the season and disproportionately reduced the quantity of the crop shipped during the calendar year.

There can be but little doubt that the exportation of certain fruits and nuts will increase steadily. The most promising items are apparently both fresh and dried apples, pears, prunes, and cranberries. Apples, pears, and prunes will need to be of high quality and well packed to compete with European home products. The question of varieties is of much importance in the case of apples intended for British markets. Color is apparently of less importance than packing, carrying quality, texture, and flavor, though with certain varieties high color adds to the selling value. The varieties grown in the United States for which there is greatest export demand and which are at present shipped in large quantities are Tompkins King, Baldwin, Northern Spy, Ben Davis, Rhode Island Greening, and Yellow Newtown, the last-named variety being best known in English markets under its Virginia synonym, *Albemarle Pippin*. Choice Virginia-grown fruit of this variety usually brings the highest prices paid for apples in the United Kingdom. In the marketing of the crop of 1895, however, it was found that choice lots of Winesap and York Imperial sold as high and in some instances brought higher prices than Yellow Newtown, a fact which should encourage growers to greater effort in production of choice fruit of those well-known varieties, and to make experimental shipments of such varieties as Paragon and other good shippers not yet tested in the export trade. The weak points in the varieties mentioned above are the tenderness of flesh and liability to bruising in Tompkins King and Northern Spy and the disposition to exhibit "barrel scald" in York Imperial. It seems entirely probable that with properly devised barrels or boxes and careful handling and packing of the fruit even such delicate varieties as Jonathan can be profitably exported. Several improved barrels and boxes are being tested by shippers with this end in view.

By using compartment boxes weighing 65 to 70 pounds each when filled, one Canadian shipper reports that he successfully shipped to England such tender autumn and early winter varieties as Oldenburg, St. Lawrence, Wealthy, and McIntosh, while Nova Scotia growers report good results with Gravenstein shipped in the same manner. One improved style of barrel is divided into two compartments by a double head located at the middle, and is designed to be sawed in two on reaching its destination and converted into two packages. Still others make use of false inner heads resting on springs, the object being to permit tight packing without danger of bruising the fruit. The prevailing package at the present time is the barrel, and the standard size that of the flour barrel.

Pears are shipped with some success from New York in boxes and half barrels, but the most extensive shipments of this fruit have been made by California shippers in the standard 50-pound boxes used in that State.

PROMISING NEW FRUITS.

Descriptions of promising new varieties of fruits and nuts of which specimens were received during 1895 are given below. Many of these varieties have not been introduced nor offered for sale by their originators. The Department does not propagate them nor distribute plants or scions except when they are donated by the originators for that purpose.

The name of the originator or introducer of each variety of new fruit, together with the post-office address, follows the name of each fruit, in order that persons desiring to obtain scions or trees for trial may correspond directly with the originator or introducer.

APPLE.

Allison, synonym *Jones Seedling* (William Hy. Smith, Leiper's Fork, Tenn.; also from Prof. R. L. Watts, Knoxville, Tenn.).—Origin, Williamson County, Tenn. Tree a moderate grower, hardy and prolific. Roundish oblate, slightly conical, and with sides slightly uneven; size large; surface moderately smooth, yellow, washed with pale red, indistinctly splashed and striped with crimson, overspread with thin russet; dots numerous, variable, brown and gray, some aureole; cavity wide, deep, flaring, russet; stem short, moderately stout; basin medium in width and depth, regular, abrupt, furrowed, and russeted; calyx segments short, wide, converging or recurved; eye medium to large, on some specimens open, on others closed; skin of medium thickness, tough; core medium to large, broad, meeting the eye, closed; seeds numerous, of medium size, plump, brown; flesh yellow, moderately fine grained, firm, crisp, juicy; subacid; very good. Season, winter.

Alpine, synonym *Alpine Crab* (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by D. C. Swadley, Johnson City, Tenn. Oblate; small to medium; moderately smooth; yellow, washed with red, and striped with darker red; dots conspicuous, large, raised yellow, some with dark centers; cavity wide, deep, flaring, russeted; stem about an inch long, slender, having bracts; basin medium in size and depth, regular, abrupt, marked by furrows and leather cracks; calyx segments short, wide, converging; eye large, open or partially closed; skin thick, tough; core small, conical, clasping, closed; seeds numerous, of medium size, angular, brown; flesh yellowish, fine grained, breaking, juicy; mild subacid, rich; good to very good. Season, winter.

Armintrout (A. Bolen, Kimball, Va.).—A seedling that came first to notice in 1873 on the top of Blue Ridge Mountains; tree a very slow grower, but an annual bearer; fruit hangs well to the limbs. Oblate, slightly conic; moderately smooth; color lemon yellow, washed with red, splashed and indistinctly striped with darker red and marked with russet patches; dots numerous, russet, some with erupted centers; cavity wide and deep, with gradual slope and slight russet markings; stem short, slender; basin medium in size and depth, regular, abrupt, russeted; calyx segments small, converging; eye very small, closed; skin thin, tough; core of medium size, oblate, clasping, nearly closed; seeds few, large, plump, brown; flesh yellowish, fine grained, moderately tender, juicy; subacid, rich; very good. Season, October to March.

Ashton (Prof. John T. Stinson, Fayetteville, Ark.).—Roundish oblate, slightly unequal; of medium size; very smooth, oily; yellowish, washed with light and dark red, and striped with dark crimson; dots numerous, minute, yellow, many indented; cavity wide, deep, flaring, marked with red-tinged russet; stem short, moderately stout; basin large, regular, deep, abrupt, furrowed and downy; calyx segments short, wide, converging or reflexed; eye small, closed; skin moderately thick, tough; core of medium size, oblate, clasping, open; seeds numerous, large,

plump, dark brown; flesh yellowish, moderately fine, very tender, juicy; sweet, rich; good to very good. Season, early winter.

Auburn (William Stammer, South Osborn, Wis.).—A seedling grown by A. D. Parson, Eureka, Wis. Roundish, above medium; very smooth, glossy; pale yellow, washed with light red and lightly striped with crimson; dots numerous, yellow, with dark centers, aureole, sometimes russet; cavity large, irregular, deep, abrupt, russeted and lipped; stem short, slender, enlarged at the twig; basin medium in size and depth, regular, abrupt, slightly furrowed; calyx segments short, wide, converging or reflexed; eye medium, closed or partially open; skin thin; core large, roundish, clasping, open; seeds numerous, of medium size, angular, brown; flesh yellowish, moderately fine, tender, juicy; mild subacid; good. Season, winter.

Banana, synonym *Winter Banana* (Prof. W. J. Green, Wooster, Ohio; also from the introducers, Messrs. Greening Bros., Monroe, Mich.).—Said to have originated on the farm of David Flory, near Adamsboro, Ind. Tree reported to be an early bearer, vigorous, and quite hardy. Oblate, almost flat, with slightly uneven sides; of medium size; smooth; yellow, with soft blush of pale red on exposed side; dots conspicuous, aureole; cavity wide, deep, flaring, slightly russeted; stem short to medium, rather slender; basin small, regular, of medium depth, flaring, furrowed; calyx segments short, wide, converging closely over the eye; eye medium, partially open; skin thick, tough, aromatic; core large, conical, clasping, partially open; seeds numerous, large, plump, brown; flesh yellowish, moderately fine, tender, juicy; mild, subacid, aromatic; good to very good. Season, winter.

Baptist (W. M. Samuels, Clinton, Ky.).—Globular, flattened, regular; of medium size; smooth; maroon color; dots numerous, light russet; cavity of medium size, irregular, deep, abrupt, russeted; stem medium in length and caliper; basin large regular, deep, flaring; calyx segments broad, reflexed; eye large, open; skin thick; core medium, oval, clasping, open; seeds numerous, of medium size, oval, pointed, plump, brown; mild, subacid; good. Season, winter.

Bennorton (Norman S. Baker, West Hoosick, N. Y.).—Originated in Pittston, N. Y., and named in honor of Benjamin Norton, of that town. Roundish oblate; of medium size; moderately smooth, finely leather cracked; color greenish yellow, washed with mixed metallic red, splashed and striped with crimson and slightly overspread with gray; dots medium in size and number, indented, some of them aureole; cavity wide, deep, gradual, russeted; stem short, moderately stout; basin large, irregular, deep, abrupt, furrowed; calyx segments short, wide, erect; eye medium, partially open; skin thick, tenacious; core small, broad, oval, clasping, partially open; seeds numerous, of medium size, plump, brown; flesh yellow, fine grained, crisp, juicy; subacid; good. Season, late winter.

Breckinridge (Prof. R. L. Watts, Knoxville, Tenn.).—Roundish truncate, unequal, ribbed; of medium size; moderately smooth, undulating; pale yellow; dots variable, brown, raised; cavity wide, very deep, abrupt, russeted; stem long, slender; basin large, regular, deep, flaring, marked by furrows and mammiform lumps; calyx segments long, converging or reflexed; eye small, nearly closed; skin thin, tender; core medium, wide, clasping, closed; seeds numerous, of medium size, short, plump, brown; flesh white, satiny, fine grained, tender, juicy; subacid; good to very good. Season, September.

Candy (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by D. C. Swadley, Johnson City, Tenn. Roundish; small; surface moderately smooth; creamy white, washed with red, splashed and striped with crimson, dots numerous, russet, many oblong and erupted; cavity medium in size and depth, regular, gradual, russeted; stem five-eighths of an inch long, medium to slender in form; basin medium in size and depth, regular, gradual, corrugated; calyx segments medium, wide, converging, slightly reflexed at points; eye medium, closed; skin thin, tough; core small, round, clasping, open; seeds numerous, large, plump, brown; flesh whitish, tinged with red, fine grained, firm, juicy; subacid, sprightly; good to very good. Season, autumn.

Cantrél, synonyms *Frazier Favorite* and *Pride of Washington* (John R. Reavis, Spokane, Wash.).—A seedling that came into fruit in 1872 on the property of Cantrél R. Frazier at Dixie, Wash. Roundish conical; very large; smooth, yellowish, striped and splashed with crimson, the crimson increasing on the exposed side almost to a solid color and partially covered with a thin bluish-grey bloom; dots medium in size, scattered; cavity large, irregular, deep, gradual, marked with intense green; stem short, stout; basin large, regular, shallow, gradual, furrowed; calyx segments wanting; eye quite large, exposed; skin thin, tender; core large, wide, clasping, open; seeds numerous, large, angular, light brown; flesh yellow, granular, juicy; subacid; good. Season, early winter.

Carolina Beauty (J. Van Lindley, Pomona, N. C.).—Oblate, slightly conical; large; surface smooth, excepting numerous russet knobs; color yellow, washed with crimson and indistinctly striped with darker crimson; dots conspicuous, yellow or russet, many with erupted centers; cavity wide, deep, gradual, russeted; stem three-fourths of an inch long, moderately stout; basin medium, regular, gradual; calyx segments long, narrow, converging to center and reflexed; eye large, partially open; skin thick, tough; core very large, wide, clasping, nearly closed; seeds numerous, of medium size, angular, dark brown; flesh yellowish, moderately fine, crisp, juicy; subacid; very good. Season, early winter.

Cochran (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by Samuel Dunlap, Friendsville, Tenn. Roundish conical, slightly oblique; large; surface moderately smooth; color rich golden yellow, with some russet and green about the basin; dots numerous, brown; cavity medium, irregular, deep, abrupt, furrowed, and russeted; calyx segments of medium length and width, slightly converging and reflexed; eye medium, partially open; skin thin, tender; core medium, conical, barely clasping, open; seeds numerous, large, plump, brown; flesh yellow, moderately fine; subacid, rich; very good. Season, August and September.

Coffman, synonym *Summer Red* (B. A. Craddock & Co., Curve, Tenn.).—Grown in Lauderdale County from sprouts as early as 1855. A supposed seedling of Red June, as the Coffman has the upright habit of that variety. The Coffman was first introduced by nurserymen in 1888. Specimens identified as the same have been received from Henderson County, Tenn., where, together with Red June, they are known as "Summer Reds" and are said by W. J. Manly, of Juno, to have been grown from roots or sprouts for fifty years or more. Oval to roundish, prolate; of medium size; smooth; greenish yellow, washed with mixed red, well covered with broken stripes of crimson, and partially covered with a thin, pale blue bloom; dots numerous, light, indented; cavity medium, irregular, variable in depth, abrupt, russeted and lipped, an occasional specimen having an appressed cavity; stem short, of medium caliper; basin medium in size and depth, regular, flaring, furrowed; calyx segments long, slender, converging and reflexed; eye very small, closed; skin of medium thickness, firm; core small, conical, clasping, open; seeds numerous, of medium size, plump, green and brown; flesh whitish, moderately fine, crisp, moderately juicy; subacid; good. Season, early summer.

Collins (Prof. John T. Stinson, Fayetteville, Ark.).—Specimens sent as Champion Red by Stark Bros., Louisiana, Mo., are identical with this. The original tree stands on the Merriman property, in proximity to Fayetteville. The apple was named by Hon. W. G. Vincenheller in 1893, when he was making the collection for the Arkansas exhibit at Chicago. He named it "Collins," in honor of Mr. George Collins, who introduced it. Tree is a vigorous grower, with a well-shaped top. Buds large; leaves flat, medium size, dark green, margin crenate. Roundish oblate, slightly unequal; large; moderately smooth, with some fine leather cracking; yellow, washed with dull and bright red, splashed and striped with crimson; dots light russet, many with dark centers; cavity large, regular, deep, flaring, russeted and slightly lipped; stem about 1 inch long, of medium caliper, curved, largest at twig; basin large, regular, deep, abrupt, slightly furrowed, and downy; calyx segments short, wide, converging; eye medium, closed, or partially open; skin of medium thickness, tough; core medium

size, conical, clasping, partially open; seeds few, of medium size, plump, brown; flesh yellow, satiny, moderately coarse, crisp, moderately juicy; subacid; good. Season, winter.

Creswell (Edwin Yenowine, Edwardsville, Ind.).—Cultivated in the neighborhood of Edwardsville, Ind., continuously since the early part of this century. Origin unknown. One orchard, said to be almost exclusively of this variety and fifty years old, is reported as bearing good crops. Mr. Yenowine says the fruit varies in color, one type being "very bright red and the other bright yellow and striped." Roundish conical; large; surface smooth, greenish yellow, washed with light and dark red, having occasional stripes of crimson on some specimens; dots gray; bloom slight; cavity wide, deep, gradual, russeted and furrowed; stem short, stout; basin of medium size, deep, regular, abrupt, furrowed and ridged; calyx segments long, converging and reflexed; eye medium, closed; skin thin, tenacious; core small, oval, open, clasping; seeds numerous, of medium size, plump, brown; flesh yellowish, coarse grained, tender, juicy; flavor subacid; quality good to very good. Season, early autumn.

Dabney (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by S. H. Stepp, Dry Creek, Tenn. Roundish oblate, some specimens slightly uneven; large; moderately smooth; greenish yellow, washed with red, striped with crimson, and overspread with russet; dots conspicuous, yellow or brown, some indented; cavity large, wide, of medium depth, gradual, russeted; stem short, moderately stout, fleshy at twig; basin large, regular, deep, abrupt; calyx segments short, wide, generally deciduous; eye large, open; skin thick, tender; core large, conical, clasping, partially open; seeds numerous, of medium size, imperfect, brown; flesh yellowish, satiny, moderately fine, tender, juicy; subacid, rich, sprightly; very good. Season, September.

Dallas, synonym *Mrs. Dallas* (M. K. Nolin, Parker, Kans.).—Origin, Linn County, Kans.; named in 1889 by Kansas Horticultural Society. Roundish oblate, slightly conical, unequal; of medium size, moderately smooth, with some russet patches and knobs; yellow, washed with mixed red and striped with broken splashes of crimson; dots minute, yellow; slight bloom in cavity and basin; cavity wide, deep, flaring, green, bloomed, and russet netted; stem short, slender; basin medium in size and depth, regular, abrupt, bloomed; calyx segments short, narrow, erect, slightly separated; eye of medium size, open; skin thick, tenacious; core small, conical, clasping, nearly closed; seeds numerous, large, short, plump, dark brown; flesh yellowish, satiny, moderately fine, spongy, juicy; subacid; good. Season, late winter.

Deaderick (Prof. R. L. Watts, Knoxville, Tenn.).—Originated in Washington County, Tenn. Roundish conical, unequal; large; smooth; lemon yellow; dots brown, with green or white bases; cavity large, regular, deep, flaring, russeted and lipped; stem short, moderately stout; basin small, regular, shallow, gradual, furrowed and downy; calyx segments short, wide, converging, reflexed at point; eye small, closed or partially open; skin of medium thickness, tough; core large, conical, clasping, partially open; seeds numerous, of medium size, plump, brown; flesh yellow, moderately juicy; subacid; good. Season, winter.

Demorest (James E. Free, Demorest, Ga.).—A seedling of Habersham County, Ga. Resembles Westfield somewhat in flavor; is worthy of test in Southern localities. Roundish oblate; size medium; surface moderately smooth, considerably russeted about apex; color yellow, washed with pale red, splashed and striped with pale crimson and overspread with russet about the basin; dots minute, brown; cavity large, regular, deep, with gradual slope and marked by russet netting; stem one-half inch long, slender; basin medium large, regular, deep, abrupt; marked by russet and shallow furrows; calyx segments medium, erect or converging; eye medium, partially open; skin thick, tough; core small, oval, clasping, nearly closed; seeds numerous, large, plump, brown; flesh whitish, satiny, moderately fine, moderately tender, juicy; flavor mild subacid, aromatic, rich; quality very good. Season, August.

Dixon (C. S. Scott, Sinks Grove, W. Va.).—Prolate, slightly oblique, ribbed; large; smooth; yellow, washed with red, splashed and striped with crimson; dots conspicuous, gray russet, many aureole; cavity large, regular, deep, abrupt, green and

downy; stem short, moderately stout, curved; basin medium in size and depth, regular, abrupt, corrugated; calyx segments medium, converging; eye large, closed; skin thick, tough; core large, clasping, conical, nearly closed; seeds numerous, large, plump, brown; flesh yellowish, slightly tinged next the skin, moderately fine grained, tender, juicy; subacid; good. Season, early winter.

Early Melon (A. H. Griesa, Lawrence, Kans.).—A Russian variety received by Mr. Griesa from Professor Budd. Roundish, slightly conical, unequal; large; moderately smooth; yellow, washed with dull red, irregularly striped with crimson, and slightly overspread with gray; dots russet brown, raised; cavity large, regular, deep, abrupt, russeted, and leather cracked; stem three-fourths of an inch long, of medium caliper; basin large, regular, deep, abrupt, russet; calyx segments medium, wide, converging, reflexed at tip; eye small, closed; skin thin, tough; core medium, wide, clasping, partially open; seeds numerous, of medium size, plump, brown; flesh yellowish, moderately fine, crisp, juicy; subacid; good. Season, autumn.

Elstun (Freeman Elstun, Milroy, Ind.).—Oval; large; moderately smooth, with a few russet patches; color pale lemon-yellow, occasionally blushed on exposed side; dots numerous, raised, brown, some erupted; cavity medium, regular, deep, abrupt, russet; stem about 1 inch long, having slender bracts; basin medium in width and depth, abrupt, marked with shallow furrows and down; calyx segments long, narrow, converging to middle, then reflexed; eye medium, nearly closed; skin of medium thickness, tough; core medium, oval, clasping, open; seeds numerous, of medium size, plump, dark brown; flesh whitish or yellowish white, fine grained, tender, juicy; sweet; good to very good. Season, autumn and early winter.

Garland, synonym *Flanders* (James M. Stone, Garland, Me.).—Said to have been brought from New Hampshire by Mr. Gordon about 1804. The tree is a vigorous grower and never winter-kills in the neighborhood of Garland, Me. Prolate, oval; of medium size; smooth; yellow, washed with mixed red and striped with dark crimson; dots numerous, yellow, russet; cavity medium in size and depth, regular, flaring, russeted and sometimes lipped; stem short, of medium caliper; basin very small, regular, very shallow, with very gradual slope, marked with conspicuous mammiform lumps; calyx segments short, wide, converging closely, reflexed at point; eye medium, nearly closed; skin thick, tough; core large, oval, clasping, open; seed few, large, plump, light brown; flesh white, deeply stained to the core line with strawberry red, moderately fine, tender, moderately juicy; mild, subacid, pleasant; very good. Season, September.

Gem Sweet (C. S. Scott, Sinks Grove, W. Va.).—The original tree, now about 50 years old, is a vigorous, slender, willowy grower, and very productive. Fruit hangs well on the tree until very ripe. Roundish conical; large; surface moderately smooth, with some russet patches and rough russet dots; color greenish yellow, washed with dull brick-dust red and irregularly striped with crimson; dots large, raised, russet; cavity wide, deep, with gradual slope and russet markings; stem short, moderately stout; basin small, regular, shallow, with gradual slope and shallow furrows; calyx segments short, wide, converging; eye large, closed, or partially so; skin moderately thick, tough; core large, wide, conical, clasping, partially open; seeds numerous, small, short, plump, brown; flesh yellowish, moderately fine, tender, moderately juicy; sweet, rich; very good. Season, August and September.

Gerard (Gerard C. Brown, Yorkana, Pa.).—A seedling about 12 or 14 years old. Oblate, slightly conic, unequal; large; moderately smooth; yellow, washed with red and striped with crimson; dots prominent, russet, some with dark centers; cavity wide, deep, gradual, russeted; stem short, slender; basin large, irregular, deep, abrupt, furrowed and finely leather-cracked; calyx segments short, wide, converging or reflexed; eye medium to large, partially open; skin thin, moderately tough; core small, conical, meeting the eye, slightly open; seeds numerous, large, plump, brown; flesh yellowish, moderately fine, crisp, juicy; subacid, rich; very good. Season, autumn.

Gilbert (the late W. L. Moores, M. D., Cyruston, Tenn.).—Roundish oblate, unequal, large; smooth; yellow, washed with dark red over most of the base, and indistinctly striped; dots variable, light russet and brown; cavity large, regular, deep, gradual, slightly lipped and lined with gilded russet; stem short, moderately stout; basin large, regular, deep, abrupt, slightly furrowed; calyx segments short, wide, converging; eye large, open; skin thick, tough; core large, conical, clasping, nearly closed; seeds few, large, angular, brown; flesh greenish yellow, moderately coarse, crisp, juicy; subacid; very good. Season, late winter. Resembles Paragon closely. Dr. Moores regarded it as superior to that variety, because more productive and an earlier bearer; also larger and more uniform in size and color.

Glenville (T. H. West, Glenville, W. Va.).—A seedling which fruited in 1895, when it was about 4 years old. Oblate; large; smooth, though ribbed; yellow, washed with mixed red, splashed with crimson, and thinly overspread with gray; dots conspicuous, yellow, a portion with dark centers; cavity wide, deep, gradual, deeply furrowed, russeted; stem very short, stout; basin large, regular, deep, abrupt, slightly furrowed, leather-cracked; calyx segments of medium size, erect or slightly reflexed; eye large, partially open; skin thin, tenacious; core of medium size, wide, clasping, open; seeds numerous, large, plump, brown; flesh yellow, fine grained, tender, juicy; sweet, rich; very good to best. Season, autumn.

Godbey (W. E. Jones & Son, Lincoln, Ill.).—Prolate; large; surface smooth, yet undulating; yellow, washed with red and richly striped with purplish crimson; dots numerous, yellow, slightly indented; cavity medium to large, regular, deep, abrupt, russeted; stem short, stout, of medium thickness; basin very large, regular, deep, abrupt, furrowed, and lined with bloom; calyx segments medium, wide, slightly recurved; eye medium to large, open or partially closed; core medium, wide, clasping, open; seeds numerous, of medium size, short, plump, brown; flesh yellowish, moderately fine grained, crisp, juicy; subacid, rich; very good. Season, autumn.

Hackman (S. M. Irwin, Geneva, Kans.).—A sprout from the root of a tree of Stark. It has been bearing several years. The form of the tree and the manner of growth resemble Ralls Genet; the fruit begins to drop in September. Oblate, slightly conic, unequal; of medium size; moderately smooth, having some russet patches, knobs, and dots; yellow washed with red and indistinctly splashed and striped with crimson; dots brown, raised, some aureole; cavity wide, deep, flaring, furrowed and russeted, stem short, of medium thickness; basin large, regular, deep, abrupt, slightly furrowed, lined with russet, which extends out on the surface; calyx segments medium in length and width, converging; eye medium, nearly closed; skin thin, tender; core small, roundish, clasping, partially open; seeds few, of medium size, plump, brown; flesh yellowish white; texture moderately fine, very tender, juicy; subacid, rich; very good to best. Season, autumn.

Hargrove (George E. Boggs, Waynesville, N. C.).—Roundish, regular; size above medium; smooth; yellow, with crimson bronze blush on the exposed side; dots numerous, brown, some aureole; cavity small, regular, of medium depth, flaring, marked with russet and lipped; stem short, moderately stout; basin small, regular, shallow, with very gradual slope, furrowed and russeted; calyx segments short, narrow, reflexed; eye medium, open; skin of medium thickness, tender; core large, conical, clasping, partially open; seeds numerous, large, plump, brown; flesh yellowish white, fine grained, breaking, juicy; subacid; good to very good. Season, winter.

Harrah, synonym *Billie's Favorite* (A. Bolen, Kimball, Va.).—An accidental seedling, originated about 1882, near Thornton's Gap, Virginia. Tree reported to be rapid grower, with large glossy leaves, making a spreading top. Oblate conical, uneven; large; surface smooth, except for russet dots; color yellow, washed with crimson, striped with darker crimson, and overspread with gray; dots prominent, variable, yellow and brown, some very large; cavity wide, deep, gradual, russeted; stem short, moderately stout; basin large, regular, deep, abrupt, furrowed and slightly russeted; calyx segments wide, of medium length, converging or reflexed; eye large, open; skin thick, tough; core large, wide, clasping, partially open; seeds numerous, of

medium size, imperfect, brown; flesh yellowish white, fine grained, very tender, juicy; subacid, pleasant; very good. Season, September to March.

Harwell (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by S. A. R. Swan, Pulaski, Tenn. Oblate, unequal; large; moderately smooth, having some russet patches; pale yellowish green, with a few dull-red stripes; dots variable, numerous, brown; cavity medium in size and depth, regular, flaring, russet netted; stem three-fourths of an inch long, moderately stout, curved, downy; basin large, regular, deep, abrupt, slightly furrowed and leather cracked; calyx segments short, wide, converging; eye large, closed or partially open; skin thick; core medium, oblate, clasping, slightly open; seeds few, of medium size, angular, imperfect, light brown; flesh greenish yellow, moderately fine, crisp, juicy; subacid; good. Season, winter.

Hedrick Sweet (C. S. Scott, Sinks Grove, W. Va.).—Originated in Greenbrier County about the beginning of this century. The variety is reported to be grown in vast quantities in the neighborhood of Sinks Grove. Oblate, slightly conical; of medium size; surface smooth; pale yellow, washed with bronzy red; dots brown and light gray, the latter erupted; cavity wide, of medium depth, gradual slope, slightly russeted; basin medium in size and depth, regular, gradual, slightly furrowed; calyx segments short, wide, reflexed; eye large, open; skin moderately thick, tough; core rather small, oval, clasping, nearly closed; seeds numerous, of medium size, plump, brown; flesh yellowish, fine grained, tender, moderately juicy; sweet, rich; very good. Season, winter.

Heidemeyer (Otto Locke, New Braunfels, Tex.).—Imported about 1850 from Stuttgart, Germany, by a Mr. Heidemeyer, of Texas. The German name has been lost, and as the apple has not yet been identified it has been given the name of the importer. Roundish conical; small; surface smooth; color golden yellow, with a few pale crimson stripes; dots minute, brown; cavity wide, deep, with gradual slope, heavily russeted, the russet extending out onto the base; stem short, of medium thickness; basin downy, of medium size, regular, with abrupt slope, netted and slightly furrowed; calyx segments short, converging; eye small, closed; skin thick, tough; core small, broadly oval, partially open, clasping; seeds few, of medium size, angular, brown; flesh yellowish, moderately fine, crisp, juicy; flavor subacid, aromatic, rich; quality very good to best. Season, August in Comal County, Tex.

Heiges (Prof. John T. Stinson, Fayetteville, Ark.).—Roundish, with flattened ends, slightly unequal; of medium size; smooth, save a few russet knobs; yellow, washed with almost solid dark purplish red and indistinctly striped with crimson; dots numerous, yellow or gray, slightly indented; cavity large, regular, deep, abrupt, marked with green and russet; stem about 1 inch long, moderately stout, bracted; basin medium in size and depth, abrupt, furrowed and finely leather cracked; calyx segments short, wide, converging; eye small, closed; skin thick, tough; core large, conical, clasping, partially open; seeds numerous, large, plump, brown; flesh yellowish, fine grained, tender, juicy; subacid, rich; very good to best. Season, early winter.

Holt (Prof. John T. Stinson, Fayetteville, Ark.).—Oblate; large; moderately smooth, with a few russet knobs; greenish yellow, washed with dull red, splashed and striped with darker red; dots both yellow and brown, some of them aureole; cavity wide, deep, irregular, abrupt, marked with russet, and very slightly lipped; stem about three-fourths of an inch long, moderately stout; basin large, irregular, deep, abrupt, slightly furrowed and russet netted; calyx segments short, narrow, converging; eye small, closed; skin thin, tender; core medium, wide, clasping, open; seeds numerous, of medium size, plump, brown; flesh greenish yellow, coarse, crisp, moderately juicy; subacid; only good. Season, winter.

Honest John (A. Bolen, Kimball, Va.).—A seedling near Brahms Gap, on the east side of the Blue Ridge Mountains; came to notice about 1865. Oblate, conical; size above medium; moderately smooth; yellow, washed with mixed red, splashed and striped with crimson; dots conspicuous, russet, with erupted centers; cavity large,

regular, deep, with gradual slope, russeted; stem short, slender; basin medium in size and depth, regular, gradual, furrowed, and leather cracked; calyx segments small, converging or slightly reflexed; eye medium, open or partially closed; skin thick, tough; core large, conical, clasping, nearly closed; seeds numerous, of medium size, plump, brown; flesh yellowish white, fine grained, crisp, juicy; mild subacid, rich; good to very good. Season, late winter.

Hopewell, synonym *Patterson* (J. G. Patterson, Stewartstown, York County, Pa.).—Seedling originated with Mr. Patterson. Oblate, conical, somewhat unequal; small; moderately smooth for a russet variety; golden yellow overspread with fine, netted russet; dots light gray; cavity medium, regular, deep, flaring, russeted and lipped; stem short, moderately slender; basin medium in size and depth, regular, abrupt, slightly furrowed and russeted; calyx segments small, converging or slightly reflexed; eye medium, partially open; skin thick, tough; core small, conical, just clasping the eye, very slightly open; seeds numerous, of medium size, plump, round; flesh yellowish, moderately fine grained, firm, juicy; very mild subacid; very good. Season, late winter.

Hurne (Prof. John T. Stinson, Fayetteville, Ark.).—Tree in orchard of E. Hurne at Weddington, Ark. Reported dwarfish in habit, with drooping branches; hardy and productive; a poor grower in the nursery. Roundish; of medium size; moderately smooth, with some fine russet and leather cracks; yellow, washed with red, splashed and striped with bright crimson, overspread with gray at the base; dots conspicuous, russet, indented; cavity medium in size and depth, regular, flaring, russet netted; stem short, of medium thickness; basin medium in size and depth, regular; flaring, furrowed, and leather cracked; calyx segments medium in length and width, converging or slightly reflexed; eye medium, nearly closed; skin thin, tough; core medium, conical, clasping, nearly closed; seeds numerous, of medium size, plump, brown; flesh yellowish, moderately fine, crisp, juicy; subacid, rich; very good. Season, autumn.

Hyder Sweet (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by F. M. Hyder, Gap-run, Tenn. Roundish conical; above medium in size, unequal; surface smooth; yellow, washed with light red and slightly striped with crimson; dots small, raised, brown; cavity large, regular, deep, abrupt, russet; stem 1 inch long, slender; basin small, regular, shallow, abrupt, corrugated; calyx segments short, wide, converging; eye small, closed; skin thin, tough; core large, wide, clasping, nearly closed; seeds numerous, large, plump, brown; flesh yellow, fine grained, crisp, juicy; sweet, rich; very good. Season, autumn.

Idura (George Hall, Champaign, Ill.).—From seed planted at Savoy, Ill., by Dr. Lyman Hall, father of George Hall. Roundish conical; of medium size; surface moderately smooth; yellow, washed, splashed, and striped with red; dots russet, some with dark centers; cavity medium in size and depth, regular, gradual, russeted; stem short, moderately slender; basin medium in size and depth, regular, abrupt, furrowed; calyx segments short, wide, converging or slightly reflexed; eye medium, closed; skin thin, tough; core large, conical, clasping, partially open; seeds numerous, of medium size, plump, brown; flesh yellowish, moderately fine grained, moderately tender, juicy; flavor sweet, rich; quality good to very good. Season, September and October.

Ironclad (E. H. Cochlin, Bowmansdale, Pa.).—An accidental seedling on the grounds of Mr. Cochlin thirty years ago. Tree hardy, and a regular, early bearer; fruit and leaves hang long on the tree; crop heavier in alternate years. Fruit oblate, roundish, unequal; size medium; surface very smooth, polished; color greenish yellow, washed with carmine and splashed and striped with crimson; dots numerous, yellow or light russet; cavity wide, deep, flaring, russeted; stem slender, of medium length; basin wide, of medium depth and gradual slope, slightly furrowed; calyx segments wide, of medium length, reflexed; eye medium, partly closed; skin thin, tenacious; core medium, wide, nearly closed, meeting the eye; seeds numerous, medium to large, plump, brown; flesh greenish yellow, moderately fine, moderately juicy; flavor subacid, aromatic; quality good to very good. Season, late winter.

Jesse (James E. Free, Demorest, Ga.).—Originated about 1875, on the farm of Jesse Morrison, in Habersham County, Ga. Tree has borne annual crops for ten or twelve years. Roundish oblate, unequal; small to medium; surface roughly russeted; golden yellow; dots russet and small, black, in clusters; cavity medium, narrow, regular, deep, abrupt, russet; stem three-fourths inch long, slender, slightly curved; basin medium in size and depth, regular, abrupt, wavy; calyx segments short, converging, slightly reflexed; eye medium, open; skin rather thin, tender; core small, oblate, conical, slightly open; seeds numerous, small, oval, plump, bright brown; flesh yellow, rather fine grained, firm; mild subacid; good to very good. Season, early winter.

Keeper (Remer Bros., Aulne, Kans.).—Originated in Marion County, Kans. Roundish, oblong, regular; size medium; smooth; greenish yellow; dots numerous, brown; cavity medium in size and depth, regular, flaring, russet; stem short, rather slender, enlarging toward twig; basin medium in size and depth, regular, abrupt, corrugated; calyx segments of medium size, erect or converging; eye small, closed; skin moderately thick, tough; core medium, round, clasping, slightly open; seeds few, small, plump, brown; flesh yellow, fine grained, breaking, juicy; mild subacid, rich; very good. Season, late winter and spring.

Keicher (Prof. R. L. Watts, Knoxville, Tenn.).—Origin, Pleasant Garden, Tenn. Roundish conical; small; smooth; greenish yellow, with dull-red striping; dots yellow; cavity medium in size and depth, regular, abrupt, russet; stem short, quite stout; basin medium in size and depth, regular, abrupt, slightly irregularly furrowed and russeted; calyx segments short, converging; eye small, partially closed; skin thin, tough; core small, roundish, partially open; seeds few, of medium size, plump, dark brown; flesh yellow, firm, moderately fine; mild subacid; good. Season, autumn.

Kimball, synonym *Dr. Dunn's Sweeting* (A. Bolen, Kimball, Va.).—Originated about 1860 near Brahm's Gap on the east side of the Blue Ridge Mountains. Roundish oblate, slightly conical; of medium size; surface only moderately smooth; color greenish yellow, washed with red, splashed and striped with darker red; dots numerous, russet, with erupted centers, many aureole; cavity medium in size and depth, regular, gradual, slightly russeted; basin small, regular, shallow, gradual, furrowed; calyx segments small, reflexed at points; eye medium, open; skin thick, tough; core large, conical, clasping, open; seeds numerous, small, plump, brown; flesh whitish, fine grained, crisp, moderately juicy; flavor sweet, rich; very good. Season, winter.

Langdon (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by R. J. White, Sewanee, Tenn. Roundish oblate; large; smooth; yellow; dots variable, brown; cavity large, regular, deep, flaring, furrowed, and russeted; stem slender; basin small, regular, of medium depth, abrupt, furrowed and russeted; calyx segments short, narrow, converging, reflexed at point; eye very small, closed; skin moderately thick, tender; core medium, wide, clasping, open; seeds very numerous, of medium size, plump, brown; flesh yellowish, fine grained, tender, juicy; subacid; good. Season, early winter.

Linn (M. K. Nolin, Parker, Kans.).—Origin, Linn County, Kans. Named in 1889 by Kansas Horticultural Society. Roundish conical, slightly unequal; size medium to large; moderately smooth, with some erupted russet dots; greenish yellow, washed with pale red, occasionally crimson and striped with darker crimson, some specimens having a heavy overspread of gray; dots variable, yellow, brown, and aureole; bloom in basin and cavity; cavity large, regular, very deep, flaring, lined with golden russet on cabbage green; stem short, slender, with bracts; basin medium, irregular, deep, abrupt, lined with bloom and slightly russeted; calyx segments medium in length and width, converging or slightly reflexed; eye small, nearly closed; skin thick, tenacious; core medium, conical, just clasping, nearly closed; flesh yellowish, satiny, moderately fine, crisp, moderately juicy; subacid; good. Season, late winter.

Lucinda (John E. Hough, Lagrande, Oreg.).—The original tree is growing in edge of woods and is thought to be a seedling of Willow Twig or Blue Pearmain, as these varieties have been grown near the place. Its hardiness at an altitude of 3,000 feet

in Union County, its fruitful habit and long-keeping qualities entitle it to mention. Prolate; large; moderately smooth, ribbed; greenish yellow, with a few indistinct splashes and stripes; dots very numerous, brown, many with green bases; cavity large, irregular, deep, abrupt, russeted and lipped; stem about an inch long, moderately stout, downy; basin large, regular, deep, abrupt, furrowed; calyx segments medium, some converging, some reflexed; eye medium, partially open, skin moderately thick, tenacious; core large, oval, clasping, open; seeds numerous, of medium size, plump, dark brown; flesh whitish, fine grained, tender, moderately juicy; subacid; quality good. Season, late winter.

Mack, synonym *Uncle Jack* (James E. Free, Demorest, Ga.).—Originated on the farm of Rev. A. J. Harris about 1840. Has been planted only in the neighborhood of its origin. Oblate, conical, unequal; large; moderately smooth; yellow, washed with red, splashed and striped with crimson; dots numerous, large, russet; cavity large, regular, deep, gradual, lined with heavy russet, which extends out over base of fruit; stem short, slender; basin medium in size and depth, regular, gradual, leather cracked; calyx segments short, wide, converging or reflexed; eye large, open; skin moderately thick, tender; core of medium size, wide, clasping, open; seeds few, large, short, plump, brown; flesh greenish yellow, fine grained, firm, moderately juicy; sweet, rich; very good. Season, September to January.

Maloney (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by I. Keicher, Conkling, Tenn. Roundish conical, oblique; large; rough, with russet patches and russet knobs; yellow, overspread with greenish and golden russet; dots brown; cavity large, regular, deep, abrupt, russet; stem short, slender; basin medium in size and depth, abrupt, russet netted; eye large, open; skin thick, tough; core large, conical, clasping, nearly closed; seeds numerous, of medium size, short, plump, round; flesh yellowish, moderately fine grained, tender, juicy; sweet, rich; very good. Season, autumn.

McMillin, synonym *McKinley's Green* (R. B. McKinley, Pekin, Tenn.).—Received also from Prof. R. L. Watts, horticulturist of the Tennessee Experiment Station, and by him reported "supposed origin, Putnam County." Globular; unequal; large; smooth; greenish yellow, with a suggestion of blush on exposed side; dots brown or gray, some aureole; cavity medium in width and depth, regular, flaring, russet; stem short, slender; basin medium in width and depth, flaring, slightly furrowed; calyx segments short, wide, converging or slightly reflexed; eye medium, open; skin thick, tough; core large, conical, just clasping the eye, open; seeds numerous, of medium size, plump, brown; flesh greenish yellow, moderately coarse, tender, juicy; subacid; good. Season, winter.

Millboy (C. S. Scott, Sinks Grove, W. Va.).—Reported as well adapted for growth in lowlands, such as creek and river bottoms, where most apples do not succeed. Roundish, slightly flattened, regular; large; smooth; yellow, washed with red and striped with crimson, having a slight bloom; dots yellow; cavity large, regular, deep, flaring, russet; stem short, moderately stout; basin medium in size and depth, flaring, slightly furrowed; calyx segments short, wide, converging; eye medium, closed; skin thin, tenacious; core large, wide, clasping, closed; seeds numerous, large, plump, brown; flesh yellowish, moderately fine, tender, juicy; sweet; good. Season, August and September.

Millbrook (P. Emerson, Wyoming, Del.).—A chance seedling in one of the town lots of Wyoming. Roundish oblate; size medium; smooth; bright red, washed and striped with darker red; dots numerous, light yellow; cavity medium in size and depth, regular, flaring, green and russeted; stem short, moderately stout; basin medium in size and depth, regular, gradual, slightly corrugated; calyx segments broken; eye medium; skin thin, tender; core medium, oval, clasping, closed; seeds numerous, of medium size, plump, brown; flesh yellowish white, firm, crisp; subacid; good to very good. Season, early winter.

Mock (Prof. John T. Stinson, Fayetteville, Ark.).—Roundish, unequal; large; moderately smooth, having some fine leather cracking; yellow, almost entirely covered with red, indistinctly striped with darker red; dots very conspicuous, of medium



size, yellow, indented; cavity medium in width and depth, irregular, abrupt, russeted and lipped; stem short, moderately stout, fleshy; basin medium in width and depth, regular, flaring, furrowed, finely russeted and downy; calyx segments short, narrow, converging or slightly reflexed at point; eye small, closed; skin moderately tough; core large, oval, clasping, open; seeds numerous, of medium size—long, plump, brown; flesh yellowish, tinged with red, moderately fine grained, moderately crisp, moderately juicy; subacid, nutty; good. Season, winter.

Nash (Prof. R. L. Watts, Knoxville, Tenn.).—Original tree said to have been on farm of Arthur Nash, in Union County, Tenn., forty years ago. Flat, unequal; large; smooth; greenish yellow, washed with dull red and at apex striped with bright red; dots russet; cavity narrow, deep, regular, abrupt, lined with russet, which spreads out on the base; stem five-eighths of an inch long, of medium thickness; basin wide, deep, irregular, abrupt, corrugated; calyx segments broad, pointed, slightly converging; eye large, open; skin thin, tough; core of medium size, oblate, conic, clasping, closed; seeds few, of medium size, roundish, plump, pointed, dark brown; flesh yellow, shaded greenish at the core, moderately fine; subacid; good. Season, autumn.

Nebo (Prof. John T. Stinson, Fayetteville, Ark.).—Elongated, conical, unequal; large; moderately smooth, having fine russet patches over much of the surface; color yellow, washed with red, indistinctly striped with crimson, and overspread with thin russet; dots conspicuous, russet; cavity medium in size and depth, irregular, gradual, lipped and russeted; basin medium in size and depth, regular, abrupt, furrowed and russeted; calyx segments very short, separated, reflexed; eye large, wide open, nearly flat; skin moderately thick, tough; core medium, conical, clasping, nearly closed; seeds few, large, short, plump, brown; flesh whitish, satiny, fine-grained, tender, moderately juicy; sweet, very rich; very good to best. Season, early winter.

Ogle, synonym *Winter Snow* (D. J. Piper, Forreston, Ill.).—Oblate, slightly oblique; size medium; smooth, except for raised dots and fine leather cracking; yellowish, washed with scarlet and striped with dark crimson; dots conspicuous, yellow, protruding, some aureole; cavity wide, deep, flaring, russet netted; stem about 1 inch long, slender, with bracts; basin large, regular, deep, abrupt, corrugated and lined with bloom; calyx segments long, narrow, converging or reflexed; eye small, closed; skin thin, tenacious; core medium, roundish, clasping, partially open; seeds numerous, small, plump, brown; flesh whitish, moderately fine grained, crisp, juicy; very mild subacid; good to very good. Season, winter.

Okolona (S. H. Stepp, Dry Creek, Tenn.).—Set as a sprout about 1880. It is a rapid grower, now nearly 20 feet high. Oblate, unequal; large; moderately smooth, with some rough russet dots; greenish yellow, washed with pale red and striped; dots conspicuous, russet, many with dark centers; cavity wide, deep, flaring, russet; stem variable from short to long, from slender to moderately stout, some fleshy; basin medium in size and depth, regular; calyx segments short, wide, converging in some specimens, reflexed in others; eye large, open or partially closed; skin thin, tenacious; core large, wide, clasping, nearly closed; seeds numerous, large, angular, brown; flesh white, satiny, fine grained, tender, dry when overripe; sweet, rich; very good. Season, August and September.

Ooltewah (Prof. R. L. Watts, Knoxville, Tenn.).—Roundish oblate, unequal; large; moderately smooth, with some russet patches; greenish yellow, ripening to golden yellow; dots numerous, variable, russet; cavity large, regular, deep, abrupt, lined with dense russet, extending out on the base; stem three-fourths of an inch long, of medium thickness; basin small, regular, of moderate depth, gradual, slightly furrowed; calyx segments long, narrow, converging or reflexed; eye medium, closed or partially open; skin thick, tough; core large, conical, clasping, closed; seeds numerous, of medium size long, pointed, dark brown; flesh yellowish, coarse grained, tender, juicy; subacid; good. Season, August.

Oostanaula (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by J. F. Fisher, Apison, Tenn. Roundish oblate; medium to large; smooth, glossy, with fine russet markings

at apex; greenish yellow, with a suggestion of blush on exposed side; dots light, with green bases; cavity large, regular, deep, flaring, russet; stem short, of medium caliper; basin large, regular, deep, abrupt, russet netted; calyx segments short, wide, erect; eye large, open; skin thin, tenacious; core small, conical, clasping, nearly closed; seeds numerous, small, plump, brown; flesh yellowish, satiny, moderately fine, tender, moderately juicy; sweet, rich; good to very good. Season, August.

Oregon Sweet (S. H. Cramer, Ottawa, Kans.).—Said to have originated in Oregon; has been cultivated in Kansas for at least eighteen years. Tree a strong, spreading grower, bears young and is productive. Roundish oblate; large; surface smooth; golden yellow; surface dots brown, subsurface dots gray; cavity large, regular, deep, with gradual slope, lipped and heavily russeted; stem short, moderately stout; basin large, regular, deep, with gradual slope, marked by mammiform lumps at base of segments; calyx segments long, narrow, converging and reflexed; eye small, closed; skin moderately thick, tough; core medium, wide, oval, clasping, closed; seeds numerous, of medium size, angular, brown; flavor sweet; quality very good. Season, late July and early August.

Ozone (Prof. John T. Stinson, Fayetteville, Ark.) (Pl. I).—Roundish, ends flattened, unequal; size above medium; moderately smooth, with many russet patches; color yellow, washed with crimson, indistinctly striped with darker crimson; dots conspicuous, yellow or gray, some indented; cavity medium, regular, deep, abrupt, marked with green and russet; stem short, moderately stout, fleshy at twig; basin medium in size and depth, regular, abrupt, slightly furrowed, and thickly leather cracked; calyx segments short, narrow, converging; eye small, closed; skin thick, tough; core medium, oblate, clasping, open; seeds numerous, of medium size, plump, brown; flesh yellow, fine grained, tender, juicy; subacid, rich; very good to best. Season, early winter.

Paragon (the late W. L. Moores, M. D., Cyruston, Tenn.).—Having on request sent both the Gilbert and the Paragon to the Department of Agriculture, Dr. Moores wrote: "Both originated in this neighborhood; both original trees are standing (December, 1895) and bore fruit this season. I named both apples and introduced them to public notice about eight years ago. The Paragon has obtained wonderful popularity, yet I believe it is an inferior apple to Gilbert, its twin brother. Both apples are apparently a cross of Black Twig (Winesap) and Lambertwig, and are so much alike in appearance as to require an expert to distinguish them." Roundish conical; large, smooth, yellow, washed with red, having a few indistinct stripes; dots of medium size, yellow; cavity large, regular, deep, flaring, russet; stem short, slender; basin medium in size and depth, abrupt, furrowed; calyx segments small, converging or slightly reflexed; eye small, nearly closed; skin thick, tough; core medium, conical, clasping, partially open; seeds numerous, of medium size, plump, brown; flesh yellow, moderately fine grained, breaking, juicy; subacid; very good. Season, winter.

Park (J. W. Adams & Co., Springfield, Mass.).—Locally this apple ranks next to Baldwin in productiveness and keeps somewhat better. Roundish; of medium size; moderately smooth; yellow, washed with brick-red, splashed and striped with crimson, having some russet splashes; dots numerous, dark brown; cavity medium in size and depth, regular, flaring, russet; stem short, slender; basin medium in size and depth, regular, slope variable from flaring to abrupt, russeted and leather cracked; calyx segments of medium length, wide, erect, converging, or reflexed; eye small, closed; core medium, wide, oval, just clasping, open; seeds numerous, large, plump, grayish brown; flesh yellow, fine grained, tender, juicy; subacid, rich; very good. Season, autumn.

Peebles (William M. Samuels, Clinton, Ky.).—Prolate, truncated, slightly oblique, slightly unequal; above medium size; moderately smooth, with some rough russet patches and erupted dots; greenish yellow, with dull bronzy blush on exposed side; dots light russet, many erupted; cavity medium, regular, deep, gradual, russet; stem short, moderately stout; basin large, regular, deep, abrupt, slightly furrowed

and leather cracked; calyx segments medium, converging one-third and reflex two-thirds of their length; eye large, partially open; skin thick, tough; core small, conical, meeting, closed; seeds numerous, of medium size, pointed, light brown; flesh yellowish, moderately fine, breaking, juicy; subacid; good to very good. Season, early winter.

Peter (T. T. Lyon, South Haven, Mich.).—Roundish, truncated, unequal, ribbed; large; smooth; greenish yellow, washed with red over most of the surface and striped with purple; dots conspicuous, yellow, many with dark centers; bloom profuse; cavity wide, deep, flaring, russet; stem short, slender; basin large, regular, deep, abrupt, furrowed and lined with bloom; calyx segments wide, converging; eye medium, closed; skin thick, tough; core large, conical, clasping, nearly closed; seeds numerous, large, plump, brown; flesh yellowish, tinged with red near the skin, fine grained, tender, juicy; subacid; good. Season, September.

Potomac (Henry S. Rupp, Shiremanstown, Pa.).—A seedling grown by George Arnold, Burlington, W. Va. Fruited first in 1893. Roundish oblate; very large; smooth; greenish yellow, with a suggestion of blush on the exposed side; dots numerous, small, brown; cavity wide, deep, flaring, green and finely russeted; stem short, moderately stout; basin large, regular, deep, abrupt, furrowed and russeted; calyx segments short, wide, reflexed; eye very large, open; core medium, wide, clasping, nearly closed; seeds numerous, of medium size, plump, brown; flesh yellowish, moderately fine grained, very tender, juicy; subacid, sprightly; very good. Season, early winter.

Pullman (C. R. Mays, Pullman, Wash.).—Oblate conical, slightly oblique; size above medium; surface moderately smooth; whitish yellow, washed and striped with two shades of red; dots many, conspicuous on the red, indistinct on the yellow portions; bloom thin, whitish; cavity broad, wavy, moderately deep, flaring, heavily russeted; stem long, quite stout, woody, uniform, downy, slightly enlarged at limb; basin medium to large moderately deep, corrugated, flaring, ribbed, and partially lined with bloom; calyx segments long, quite narrow, meeting over the eye, then flaring, and sometimes reflexed; eye medium to large, closed or slightly open; skin thick, tough; core large, broad, conical, clasping, open; seeds numerous, of medium size, long, pointed, light brown; flesh yellowish, almost yellow, fine grained; mild subacid; very good. Season, early winter.

Ragsdale, synonym *Smith's Seedling* (the late W. L. Moores, M. D., Cyruستن, Tenn.).—Originated on farm of one Edward Smith on the highlands of north Alabama. It has been propagated in a small way by a local nursery since about 1888. Roundish conical, regular; large; moderately smooth; pale greenish yellow, with a slight blush on the exposed side; dots minute, brown, many with green bases; cavity large, regular, deep, abrupt, russeted, and slightly lipped; stem short, slender; basin of medium size, regular, deep, abrupt, furrowed; calyx segments long, narrow, converging or slightly reflexed at tip; eye small, closed; skin thick, tough; core small, conical, clasping, partially open; seeds numerous, large, plump, brown; flesh yellowish, with dark yellow veins, rather coarse, breaking, moderately juicy; subacid; very good. Season, winter.

Randolph (H. T. Vose, West Point, Ark.).—Disseminated about 1870 by the late Randolph Peters, of Wilmington, Del., as "Unknown," the variety having been propagated by him from an unidentified tree in an orchard, then forty years old, on his place. As there were many apples designated as "Unknown," Mr. Vose secured permission from Mr. Peters to name this one "Randolph," and under this name he has continued to propagate it. The tree is reported to be healthy and vigorous, an early annual bearer, that sets its fruit singly, rarely in pairs, on short spurs. Though small, the Randolph is more uniform in size than Red June and other cluster apples. Oblate; size below medium; smooth, glossy; yellowish white, washed with red, splashed and striped with crimson; dots gray, indented; bloom slight; cavity wide, of medium depth, flaring, greenish and russeted; stem about half an inch long, of

medium caliper, somewhat fleshy near the fruit; basin medium in size and depth, regular, flaring, having mammiform lumps at the bases of the calyx segments; calyx segments long, wide, lapping closely over the eye and reflexed above the middle; eye small, closed; skin of medium thickness, brittle; core medium, wide, conical, clasping, closed; seeds numerous, of medium size, plump, light brown; flesh yellowish white, moderately fine, firm, moderately juicy; subacid; good. Season, about two weeks later than Red June.

Red Carver (Peder Pedersen, Huntingdon Valley, Pa.).—Originated and grown for many years in Montgomery County, Pa., but found only in three orchards by Mr. Pedersen in 1895. The tree is reported to bear every year, very heavily in alternate years. The fruit hangs well to the tree, is unsurpassed for cooking, and is a good table fruit from the beginning of January till the middle of March. Roundish conical, regular; size medium; moderately smooth, oily, with a few russet knobs; yellowish white, washed with red, striped with darker red, and thinly overspread with gray; dots numerous, minute, light or brown; cavity medium, wide, of medium depth and very gradual slope, russeted; stem short, slender to moderately thick; basin medium in size and depth, regular, abrupt, corrugated; calyx segments short, wide, converging; eye medium, closed or partially open; skin thick, tough; core large, conical, clasping, partially open; seeds numerous, large, plump, brown; flesh yellowish, tinged red, moderately fine grained, breaking, juicy; subacid, sprightly; good. Season, winter.

Rhea (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by J. D. Ellis, Dayton, Tenn. Tree 40 or 50 years old. Roundish oval, slightly truncated, slightly unequal; size medium; smooth; yellow, washed and striped with red; dots few, russet; cavity medium, irregular, deep, abrupt, dark green and slightly russeted; stem short, slender; basin medium in size and depth, regular, flaring, corrugated; calyx segments erect; eye medium, open; skin thin, leathery; core medium, oval, clasping, open; seeds numerous, of medium size, oval, pointed, plump, brown; flesh white; mild subacid; good to very good. Season, fall.

Rosedale (Pippin) (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by I. Keicher Conkling, Tenn. Roundish oblate, unequal; size above medium, smooth; yellow, washed with red, striped and splashed with dark crimson; dots conspicuous, yellow, indented; cavity large, regular, deep, gradual, russeted; stem one-half to three-fourths inch long, moderately slender; basin of medium size, regular, shallow, gradual to abrupt, furrowed; calyx segments medium in width and length, converging or reflexed; eye medium, closed or partially open; skin thick, woody; core medium, wide, clasping, open; seeds numerous, small, plump, brown; flesh yellowish, moderately fine, tender, juicy; subacid, rich; good to very good. Season, autumn.

Russian Baldwin (T. H. Hoskins, Newport, Vt.).—An all-winter Russian apple of commercial value, the tree of which was received from the late Charles Gibb. Roundish oblate; above medium size; surface smooth; yellow, washed with mixed red, splashed and striped with crimson; dots erupted, russet; cavity medium, irregular, with gradual slope, slightly lipped and somewhat russeted; stem of medium size, short; basin small, regular, shallow, furrowed; calyx segments short, wide, converging; eye small, closed or nearly so; skin thin; core large, wide, partially open, clasping; seeds numerous, small, plump, dark brown; flesh yellowish white, moderately fine, moderately juicy; flavor subacid; quality good. Season, late winter.

Seaford (Charles Wright, Seaford, Del.).—Roundish, regular; size medium; smooth; greenish yellow, washed with red and indistinctly striped with crimson; dots gray, some indented; cavity large, regular, deep, abrupt, russet; stem short, moderately stout; basin small, regular, shallow, flaring, russeted and slightly furrowed; calyx segments short, wide, lapping closely over the eye; eye small, closed; skin thin, tender; core large, roundish, clasping, partially open; seeds numerous, of medium size, plump, brown; flesh greenish yellow, moderately fine, meaty, juicy; subacid, rich; very good. Season, winter.

Seal (J. A. Applegate, Mount Carmel, Ind.).—Originated about 1885 in an old blue-grass pasture. Roundish truncate, regular; size medium; moderately smooth, with numerous russet knobs and dots; yellow, washed with red, splashed and striped with crimson and a suggestion of gray overcolor; dots conspicuous, russet, with dark centers or aureole; cavity medium, regular, deep, abrupt, slightly russeted; stem three-eighths to five-eighths of an inch long, slender; basin large, regular, deep, abrupt, slightly furrowed and leather cracked; calyx segments medium, converging slightly or reflexed at point; eye medium to large, open or partially closed; skin moderately thick, tenacious; core medium, conical, clasping, partially open; seeds numerous, of medium size, plump, brown; flesh yellow, moderately fine grained, breaking, juicy; very mild subacid; very good. Season, winter.

Senator, synonym *Oliver* (Prof. John T. Stinson, Fayetteville, Ark.).—Of somewhat recent origin, yet extensively propagated in portions of Arkansas. Roundish oblate, unequal; large; smooth, except for the large erupted russet dots, which are very conspicuous; color almost solid red washed on yellow ground, indistinctly striped with crimson; cavity large, deep, regular, flaring, russeted; stem about one-half inch long, moderately slender; basin large, regular, deep, abrupt, marked by concave furrows; calyx segments short, reddish, converging or slightly reflexed at point; eye medium, open; skin thick, tough; core small, conical, meeting, closed; seeds numerous, of medium size, plump, brown; flesh yellowish white, tinged with red, moderately fine grained, very tender, granular, juicy; subacid, rich; very good. Season, late autumn.

Sevier (Prof. R. L. Watts, Knoxville, Tenn.).—A seedling grown by J. M. Bell, Mynath, Tenn. Roundish, unequal; medium to large; surface smooth, except for a few russet knobs; color creamy white, washed with red, striped and splashed with crimson; dots medium, russet; cavity large, irregular, deep, abrupt, russeted; stem short, medium to slender; basin medium in size and depth, regular, abrupt, marked by shallow furrows; calyx segments short, wide, converging; eye small, closed; skin thin, tough; core medium, wide, oval, clasping, partially open; seeds few, above medium in size, plump, brown; flesh yellowish, satiny, moderately fine, juicy; subacid; good. Season, August.

Shasta Blood (Edwin R. Burke, Bayles, Cal.).—Roundish, prolate; large; smooth; greenish yellow, washed with mixed light and dark red, and marked with broken splashes and stripes of crimson; dots medium, yellow or brown, some indented and aureole; cavity medium size, irregular, deep, abrupt, slightly russeted; stem of medium length, medium caliper, enlarged at twig; basin medium in size and depth, regular, flaring, furrowed and finely russeted; calyx segments of medium size; eye medium, partially open; skin thin; core large, conical, clasping, partially open; flesh yellowish white, deeply stained with red from skin to core line, moderately fine grained, tender, moderately juicy; subacid; good. Season, winter.

Shenk (A. Bolen, Kimball, Va.).—A seedling originated about 1860 near Thorntons Gap, on the west side of the Blue Ridge Mountains. Tree thrifty, productive, and an annual bearer. Roundish, slightly conical; size above medium; moderately smooth, with some russet patches; color yellow, washed with mixed red, splashed and striped with darker red and overspread with gray; dots numerous, yellowish, many with dark centers; cavity of medium size and depth, regular, gradual slope, russeted; basin small, regular, shallow, gradual, furrowed and downy; calyx segments medium, converging; eye medium, closed; skin thick, tough; core large, wide, clasping, partially open; seeds numerous, of medium size, imperfect, brown; flesh yellowish white, fine grained, tender, very juicy; subacid; very good. Season, late winter.

Skellon (Prof. John T. Stinson, Fayetteville, Ark.).—Roundish conical; large; smooth; yellow, washed over nearly entire surface with dark red, showing a few dark-crimson stripes and covered with a thin overspread of gray; dots conspicuous, yellow, indented; cavity medium, regular, deep, flaring, heavily netted with russet; stem short, of medium caliper; basin small, regular, medium depth, abrupt,

corrugated and leather cracked; calyx segments medium, converging and reflexed; eye small, closed; skin thin, tenacious; core medium, conical, clasping, partially open; seeds numerous, large, plump, brown; flesh yellowish, stained with red, moderately fine grained, tender, juicy; subacid; good. Season begins parallel with early June.

Spalding, synonym "*Prince George's County Pippin*" (Scott Armstrong, Forestville, Md.).—Found as a scrubby tree in a fence row about 1870; was trimmed up and has been bearing about fifteen years. The fruit resembles Virginia Greening. Roundish, slightly conical, slightly unequal; large; smooth, except russet dots and a few patches of fine russet; greenish yellow, with a bronzed blush on exposed side; dots variable, russet, many with erupted centers; cavity medium, regular, deep, abrupt, heavily russeted; stem short, of medium caliper, uniform; basin medium in size and depth, regular, abrupt, furrowed; calyx segments small to medium, converging or slightly reflexed; eye medium to large, open or partially closed; skin moderately thick, tough; core large, conical, meeting, nearly closed; seeds numerous, of medium size, plump, brown; flesh yellowish, fine grained, tender, juicy; subacid; good to very good. Season, winter.

Stinson (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by Bird, Dew & Hale, Treeville, Tenn. Roundish; large; surface moderately smooth; greenish yellow, washed with pale red, splashed and indistinctly striped with crimson, overspread with faint gray; dots variable in size, russet, erupted; cavity large, regular, deep, gradual, russeted; stem very short, moderately stout; basin medium in size and depth, regular, abrupt slope, furrowed and russeted; calyx segments short, narrow, reflexed; eye medium, open; skin moderately thick; core medium, roundish, clasping, nearly closed; seeds numerous, large, plump, brown; flesh yellowish, moderately fine, crisp, juicy; subacid, rich; very good. Season, autumn.

Stout (Wilbur C. Stout, Monrovia, Ind.).—Tree 50 years old. Prolate, slightly conical; size medium; smooth, oily; yellow; dots numerous, greenish russet and white; cavity large, round, deep, abrupt, russet; stem of medium length, slender; basin large, round, deep, abrupt, corrugated; calyx segments short, green, meeting; eye small, closed; skin thin, tender; core medium, oval, clasping, open; seeds numerous, of medium size, oval, brown; flesh yellowish white, crisp; subacid, rich; good. Season, autumn.

Sullivan (George McNiell, Paris, Tenn.).—A chance seedling on the farm of Peyton R. Sullivan, near Paris, Tenn. Oblate, slightly conical, unequal; of medium size; smooth; yellow, washed with mixed red, splashed and indistinctly striped with crimson, and thinly overspread with gray toward the base; dots numerous, small, prominent, brown or yellow, many aureole; cavity wide, deep, flaring, russet; stem short, slender; basin medium in size and depth, regular, abrupt, furrowed and leather cracked; calyx segments medium to long, narrow, converging or reflexed; eye small, closed or partially open; skin thick; core small, conical, meeting the eye, open or nearly closed; seeds few, of medium size, plump, brown; flesh yellowish, fine grained, tender, juicy; subacid, rich; very good. Season, winter.

Swadley, synonym *Red Pippin* (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by D. C. Swadley, Johnson City, Tenn. Oblate; of medium size; moderately smooth, with some leather cracking and rough russet dots; yellow, washed with red, splashed and striped with dark crimson; dots conspicuous, russet, many with dark centers; bloom slight; cavity wide, deep, flaring, russet; stem short, of medium thickness; basin large, regular, deep, flaring, leather cracked; calyx segments of medium size, converging, points reflexed; eye large, open or partially closed; skin thick, tough; core small, wide, clasping, nearly closed; seeds few, of medium size, moderately plump, dark brown; flesh yellow, moderately fine, tender, juicy; subacid, rich; very good. Season, autumn.

Sweet Ben Davis (Prof. John T. Stinson, Fayetteville, Ark.).—Originated about 1870 on farm of Garrett Williams, in Madison County, Ark. The tree resembles Ben

Davis in shape, wood, and leaf, and is nearly as good a bearer. The fruit ripens about two weeks earlier than Ben Davis. Roundish, truncated, slightly oblique, slightly unequal; large; smooth, except for a few russet knobs; greenish yellow, washed with pale red, striped and splashed with crimson; dots numerous, brown; cavity large, regular, deep, abrupt, furrowed and russet netted; calyx segments short, wide, converging or slightly reflexed; eye large, partially open; skin thick, tough; core large, roundish, clasping, nearly closed; seeds numerous, large, angular, brown; flesh whitish, satiny, juicy; sweet; good. Season, winter.

Tippecanoe (A. R. Ryman, Cedar Grove, Ind.).—First fruited in 1895 on the farm of Jacob Grabel in Franklin County, Ind. Roundish, unequal, ribbed; large; moderately smooth; rich yellow, with bronze blush on exposed side; dots conspicuous, gray, brown, many of them aureole; cavity large, irregular, deep, flaring, russet; stem short, stout, fleshy; basin medium in size and depth, regular, abrupt, slightly furrowed; calyx segments short, wide, converging or slightly reflexed at point; eye medium, partially open; skin of medium thickness, tough; core medium, round, clasping, closed; seeds numerous, of medium size, plump, brown; flesh yellowish, fine grained, crisp, juicy; subacid; good. Season, autumn.

Tommy, synonym *Tommy Sweet* (E. G. Fowler, Port Jervis, N. Y.).—Grown by Thomas G. Hardy, Spring Glen, N. Y. Fruit roundish; size medium; very smooth surface; pale yellowish white; dots brown, variable; cavity large, regular, deep, gradual, russeted; stem 1 inch long, slender; basin medium in size and depth, regular, gradual, corrugated; calyx segments medium in length and width, closely converging; eye small, closed; skin thin, tender; core large, wide, clasping, nearly closed; seeds few, large, plump, brown; flesh yellowish, very fine grained, tender, juicy; sweet, rich; very good. Season, autumn.

Twisty (John A. Moomaw, Fruitdale, Ohio).—Originated in 1802 from seed planted at South Salem, Ross County, Ohio, by James Wilson. The tree is a regular and abundant cropper. Roundish, truncate, regular; small; smooth; yellowish white, washed on one side with pale red and beautifully striped with scarlet and crimson; dots few, yellow; bloom slight; cavity medium, irregular, deep, abrupt, russeted and occasionally lipped; stem variable in length, from three-eighths to three-fourths of an inch, slender; basin medium in size and depth, regular, flaring, furrowed, and occasionally dotted with mammiform lumps; eye small, tightly closed; skin thin, tender; core large, roundish, clasping, partially open; seeds numerous, small, short, plump, brown; flesh yellowish, fine grained, very tender, juicy; subacid, aromatic, rich; very good to best. Season, late summer and autumn.

Twyford, synonym *Twyford Beauty* (Thomas J. Garden, Gardenia, Va.).—Received by Mr. Garden in 1889 in the form of buds from South Australia. Roundish conical, ribbed, slightly unequal; large; moderately smooth; yellow, washed with red, striped with crimson, and overspread with gray; dots conspicuous, yellow; cavity wide, deep, flaring, russet; stem one-half to three-fourths inch long, of medium thickness, ribbed; basin medium in size and depth, regular, abrupt, furrowed; calyx segments short, wide, converging or slightly reflexed; eye large, partially open; skin thick, tenacious; core large, wide, clasping, nearly closed; seeds numerous, of medium size, short, plump, brown; flesh yellowish, moderately coarse, crisp, juicy; mild subacid; good. Season, autumn and early winter.

Verbena (William Stammer, South Osborn, Wis.).—A chance seedling that came up about 1880 near a road fence. Oblate, unequal; of medium size; smooth; pale yellow, striped and splashed with crimson, and considerably russeted; dots numerous, large; cavity broad, deep, regular, flaring, russeted; stem 1 inch long, slender; basin large, regular, of medium depth, abrupt, furrowed; calyx segments wanting; eye large, open; core large, wide, clasping, closed; seeds few, large, angular, dark brown; flesh yellow, firm, fine grained, juicy; mild subacid, rich; very good. Season, winter.

Via (Benjamin Buckman, Farmingdale, Ill.).—Oblate, slightly unequal; size medium; smooth, greenish yellow, washed with pale red, blushed crimson, overspread

with gray; dots vary from gray to russet, erupted; cavity wide, deep, flaring, russet; stem about 1 inch long, of medium caliper, red, bracted, downy; basin large, regular deep, abrupt, slightly furrowed; calyx segments long, narrow, converging, slightly reflexed at point; eye medium, closed; skin thin, tough; core of medium size, wide, conical, clasping, open; seeds numerous, large, plump, dark brown; flesh yellowish, tinged with red at calyx tube, fine grained, crisp, juicy; mild subacid; good to very good. Season, autumn.

Vineland, synonym *Reeves's Favorite* (N. A. Patterson, Vineland, Tenn.).—An old tree and probably a chance seedling. Oblate; above medium size; smooth, oily; greenish yellow, washed with pale red, splashed and striped with darker crimson; dots conspicuous, yellowish or russet, many aureole; bloom slight, bluish; cavity wide, deep, flaring, russet; stem short, moderately slender; basin large, regular, deep, flaring, furrowed and having some bloom; calyx segments short, converging about half way, then reflexed; eye medium, partially open; skin thin, tough; core large, wide, clasping, open; seeds numerous, large, plump, brown; flesh greenish yellow, moderately fine, crisp, juicy; mild subacid, rich; very good. Season, early winter.

Virginia Beauty (J. H. Masters, Nebraska City, Nebr.).—Roundish, slightly conical; size above medium; very smooth, with a few russet dots or knobs; color greenish yellow, washed with purplish red, striped with dark red; dots small, yellow and brown; cavity large, regular, deep, abrupt, marked with russet nettings; stem one-half inch long, slender; basin small, regular, of moderate depth, gradual, furrowed and downy; calyx segments medium, converging or reflexed; eye medium, closed or partially so; skin moderately thick, strong; core large, conical, clasping, partially open; seeds numerous, small, plump, brown; flesh greenish yellow, moderately fine grained, juicy; sweet; good to very good. Season, winter.

Walter Pease (George Wilcox, Shaker Station, Conn.).—A seedling that originated about the first of this century in the town of Somers, Conn., with the gentleman whose name it bears. Roundish, large; smooth; greenish yellow, washed with pale brick red, splashed and striped with crimson; dots numerous, light russet or gray; bloom slight; cavity large, regular, deep, flaring, greenish, and very slightly russeted; stem short, of medium caliper, curved; basin medium to large, regular, medium to deep, abrupt, furrowed; calyx segments long, narrow, converging, reflexed at point; eye of medium size, nearly closed; core medium, oval, meeting, nearly closed; seeds few, of medium size, angular, brown; flesh whitish, moderately fine grained, tender, juicy; subacid; very good. Season, autumn.

Woodpile (Prof. R. L. Watts, Knoxville, Tenn.).—Grown by N. R. Keese, Keese, Tenn. Roundish conical; large; smooth; color yellow, washed and indistinctly striped with pale red; dots numerous, brown; cavity large, regular, deep, with gradual slope, russeted; stem short, moderately stout; basin medium, regular, of moderate depth and abrupt slope, furrowed and russeted; calyx segments short, wide, converging or reflexed; eye large, partially open; skin thin, tenacious; core small, conical, clasping, nearly closed; seeds numerous, large, plump, brown; flesh yellowish, fine grained, tender, juicy; mild subacid; very good. Season, September.

Zoar, synonym *Transparent Zoar*, see Downing's Appendix p. 70 (James R. Johnson, Coshocton, Ohio).—The trees were obtained by Mr. Johnson from the German colony at Zoar, Ohio. The tree is reported to be vigorous and a quite regular and full bearer. Roundish oblate; regular; large; very smooth; quite unique in color, being creamy white, washed with metallic red and indistinctly striped with pale crimson; dots yellow and brown; bloom slight in basin and cavity; cavity large, regular, deep, flaring, slightly russeted; stem short, stout; basin medium, regular, deep, abrupt, furrowed; calyx segments medium, converging or erect; eye medium, partially open; skin thin, tenacious; core medium, wide, clasping, nearly closed; seeds numerous, medium, plump, brown; flesh yellowish, satiny, very fine grained, very tender juicy; subacid; very good. Season, late autumn.



D. G. Passmore

A. H. H. & L. H. H. H.

CALVIN PEAR.

PEAR.

Ayer (G. C. Brackett, Lawrence, Kans.).—Originated and grown by O. H. Ayer, Lawrence, Kans. The tree is upright in habit, and in Douglas County, where it originated, is reported hardy, resistant to disease, and very productive. Obovate obtuse pyriform; of medium size; moderately smooth, having some russet patches; color pale, clear lemon yellow; dots numerous, minute, russet; cavity large, irregular, deep, abrupt, marked with russet wrinkles; stem three-fourths of an inch long, moderately stout, slightly curved, russeted; basin medium in size and depth, regular, flaring, marked with shallow corrugations and russet; calyx segments short, fleshy, converging or slightly reflexed; eye of medium size, open or partially closed; skin thin, woody, slightly bitter; core small, oval, clasping, closed; seeds numerous, about half of them imperfect, of medium size, plump; flesh whitish, fine grained, tender, juicy; very mild subacid, rich; very good. Season early—just before Clapp Favorite.

Calvin (George Ruedy, Colfax, Wash.) (Pl. II).—Originated by Calvin Throop. Tree upright, thrifty; shoots strong. Reported to be a good annual bearer and hardy. Oval pyriform, ribbed; of medium size; smooth, except a few russet patches; yellow, blushed and indistinctly striped with crimson; dots numerous, minute, brown or yellow, many with dark centers; cavity medium in size and depth, irregular, flaring or abrupt, lipped and russeted; stem very short, moderately stout; basin medium in size and depth, regular, flaring, furrowed and russeted; eye of medium size, open; skin thin, strong; core small, oval, clasping, partially open; seeds few, small, plump, brown; flesh yellowish white, buttery, melting, juicy; sprightly subacid; good. Season, September.

Canton (W. H. Cassell, Canton, Miss.).—Originated about 1883 in Madison County, Miss.; it has borne several crops. The growth is described as short and very stocky. Oval, turbinate; sides unequal; of medium size; moderately smooth; somewhat russeted, greenish, shading to yellow, with a coppery red blush; dots minute, brown; cavity small, irregular, shallow, flaring, wrinkled, russeted; stem $1\frac{1}{4}$ to $1\frac{1}{2}$ inches long, moderately stout; basin irregular, large, deep, with gradual slope, marked with russet; calyx segments narrow, erect or slightly reflexed; eye small, open or partially closed; core oval, clasping, large, partially open; seeds rather numerous, plump, large, light brown; flesh whitish, translucent, buttery, tender, juicy; flavor sweet, sprightly, very slightly astringent; quality very good. Season, August.

Cole, synonym *Cole's Winter* (Thomas J. Garden, Gardenia, Va.).—A seedling of which Mr. Garden received buds from the Horticultural Gardens at Victoria, Australia. Short, pyriform; of medium size; surface russeted, undulating, having a well-defined, suture-like groove running from stem to eye; color yellow, with russet overspreading about one-half the surface and a suggestion of blush on the exposed side; dots brown or russet; cavity small, regular, shallow, flaring, russeted and lipped; stem $1\frac{1}{4}$ to $1\frac{1}{2}$ inches, large, regular, deep, abrupt, russeted; calyx segments long, narrow, connected at fruit but separating widely toward the tips, which are reflexed; eye large, open; skin thick; core of medium size, oval, meeting, closed; seeds numerous, large, plump, nearly black; flesh white, satiny, tender, melting, juicy; subacid, sprightly; very good. Season, autumn.

Koonce (George Gould & Son, Villa Ridge, Ill.).—Pyriform; of medium size; smooth; greenish yellow, with a bronze cheek; dots minute, light russet; cavity of medium size, regular, shallow, flaring; stem 1 inch long, slender; basin of medium size, regular, shallow, flaring; calyx segments erect, a little twisted; eye deep; skin tender, granular; core medium, oval, clasping, open; seeds numerous, medium size, oval, pointed, light brown; flesh white, granular; flavor insipid; quality scarcely good. Season, July 1 to 10.

Lincoln (W. E. Jones & Son, Lincoln, Ill.).—Said to have originated from seeds planted in 1835 by Mrs. Maria Fleming in Logan County, Ill. The original tree is

yet standing, and said to be free from blight and to have produced as much as 50 bushels of fruit in a single year. Pyriform; large; surface moderately smooth, somewhat undulating; greenish yellow, with slight traces of russet; dots minute, brown; skin thin, tenacious; cavity regular, very small and shallow, with gradual slope, creased and slightly russeted; stem of medium length, rather stout, having bracts and becoming fleshy at insertion; basin regular, of medium depth and slope, marked with shallow furrows; calyx segments of medium size, erect or slightly reflexed; eye medium, open; core oval, clasping, large, nearly closed; seeds numerous, of medium size, plump, brown; flesh whitish, fine grained, buttery, melting, very juicy; flavor sprightly subacid, vinous; quality good to very good. Season, August.

Macomber (Benjamin Buckman, Farmingdale, Ill.).—Origin, Vermont. Pyriform; of medium size; smooth, except a slight russet netting; greenish yellow, with beautiful blush on exposed side; dots numerous, minute, russet; cavity full, with convex slope and russet markings; stem 1 inch long, moderately stout, fleshy at insertion, russet, with light-gray dots; basin medium in size and depth, regular, flaring, with russet markings; calyx segments of medium length, converging or reflexed; eye of medium size, open or partially closed; skin moderately thick, tough; core large, wide, clasping, closed; seeds few or none; flesh whitish, with a greenish core line, buttery, melting, juicy; sweet, rich; very good to best. Season, September.

Ogereau, synonym *Anne Ogereau* (T. T. Lyon, South Haven, Mich.).—Pyriform; large; moderately smooth; yellowish green, patched with fine netted russet; dots numerous, russet; cavity flat, lipped and russeted; stem 1 inch long, stout, fleshy toward the twig; basin medium in size and depth, irregular, flaring, furrowed and russeted; calyx segments short, erect; eye of medium size, nearly closed; skin thick, tough; core large, oval, clasping, closed; seeds rather numerous, variable in size and plumpness, brown; flesh greenish white, granular, tender, juicy; mild subacid; good. Season, early September in Van Buren County, Mich.

Ozark (John Gabler, Springfield, Mo.).—Originated about 1845 from seed taken by a Mr. Rooks from Kentucky to Polk County, Mo. Oblate; large; moderately smooth; greenish yellow, with a few russet veinings and patches and a suggestion of blush on the exposed side; dots numerous, minute, russet; cavity large, regular, deep, flaring, russeted in some specimens; stem $1\frac{1}{4}$ to 2 inches long, moderately stout, bracted, curved, brown; basin large, of medium depth, regular, flaring, marked by mammiform lumps at base of segments; calyx segments short, stout, erect or slightly reflexed; eye large, open; skin thin, tender; core of medium size, oval, clasping, closed; seeds few, imperfect, small, brown; flesh whitish, with yellowish veins, buttery, granular; mild subacid; good. Season, August.

Posey (A. R. Ryman, Cedar Grove, Franklin County, Ind.).—Found in fence row on farm of Jacob Grabel, where it originated about 1880. It was transplanted into orchard, where its growth is stocky and its annual crop abundant. Fruit pyriform; of medium size; moderately smooth; lemon yellow; dots small, brown; cavity very small, very shallow, regular, marked with russet; stem 1 to $1\frac{1}{2}$ inches long, moderately stout; basin small, shallow, regular, flaring, corrugated; calyx segments short, narrow, converging; eye small, nearly closed; skin thick, tender, astringent; core of medium size, oval, closed, meeting the eye; seeds few, large, plump, brown; flesh whitish, buttery; mild subacid; good to very good. Season, September to December.

Shindel (J. A. Stahle, Emigsville, Pa.).—Locally grown for seventy-five years and never affected by blight; very productive. Roundish obovate; of medium size; rather smooth; lemon yellow, with thin golden russet patches and veinings; dots numerous, minute russet; cavity irregular, of medium size and depth, abrupt, somewhat wrinkled; stem of medium length, rather stout, fleshy at insertion; basin irregular, of medium size and depth, abrupt, furrowed and russeted; calyx segments long, erect, clasping at the tip; eye small, closed; core oval, small, meeting the eye, closed; seeds numerous, small, plump, brown; flesh whitish, rather fine, granular, moderately juicy; flavor mild, sugary, moderately rich; quality good. Season, August and September.

Stout (Wilbur C. Stout, Monrovia, Morgan County, Ind.).—Originated in the first third of the century. It is claimed to be hardier than the Kieffer, and without "off years" in fruiting. Obovate, pyriform, ribbed; of large size; moderately smooth, with some russet patches; greenish yellow, ripening to bright yellow; cavity large, deep, irregular, abrupt, russeted and furrowed; stem 1 inch long, moderately stout, marked with russet dots; basin wide, deep, flaring, furrowed and russeted; calyx segments narrow, long, erect or partially reflexed; eye small, open; skin thin, bitter; core large, nearly closed; seeds few, small, angular, brown; flesh whitish, satiny, fine grained, buttery, melting; mild subacid, sprightly; very good. Season, autumn.

Sudduth (Augustine & Co., Normal, Ill.).—Propagated from an old tree near Williamsville, Ill. The Williamsville tree is reported to be 75 years old and very large. Obovate, oval; of medium size; moderately smooth, with some russet patches; color green; dots numerous, minute, brown; cavity medium in size and depth, regular, abrupt, furrowed; stem $1\frac{1}{2}$ inches long, slender; basin medium in size and depth, irregular, flaring, marked by furrows and mammiform lumps; calyx segments long, narrow, reflexed; eye large, open; skin thick, leathery; core of medium size, oval, meeting the calyx tube, closed; seeds numerous, of medium size, variable in form, light brown; flesh whitish, moderately fine, tender, juicy; flavor mild, almost sweet; quality good. Season, September.

APRICOT.

Sunrise (Stark Brothers, Louisiana, Mo.).—Russian. Form roundish oval; size medium; surface velvety, with short, persistent down; color orange yellow; dots minute, pink; cavity medium in size and depth, regular, abrupt, marked with pink; suture shallow, from cavity to apex; apex a slightly raised point at end of suture; skin moderately thick, moderately tenacious; stone large, oval, free; flesh golden yellow, meaty, tender, juicy; subacid; good. Season, June 27 to July 6 in Pike County, Mo.

Superb (A. H. Griesa, Lawrence, Kans.).—Form roundish oval; size medium; surface smooth; dull yellow or light salmon; dots numerous, variable in size, red or russet; down abundant, short; cavity medium to large, regular, variable in depth, flaring; suture quite distinct, from cavity to apex; apex a small russet dot at end of suture; skin thin, tough, tenacious; stone medium in size, oval, free; flesh dull yellow, firm; mild subacid; good. Season, first to middle of July.

Yolo (Charles P. Summers, Yolo, Cal.).—Originated with D. W. Nutting, of Yolo, Cal. Tree hardy and thrifty; an annual and very prolific bearer. Roundish oval; very large; surface velvety, with soft, persistent down; color pale yellow, heightened on exposed side to a rich golden; dots brown, russet; cavity large, regular, deep, abrupt; stem short, stout; suture very deep at cavity, extending from cavity to apex; apex a slightly russeted dot at end of suture; skin medium in thickness and tenacity; stone large, oval, free; flesh deep yellow, meaty, tender, moderately juicy; sweet, rich; very good. Season, middle of July.

CHERRY.

Baltavar (C. E. Hoskins, Springbrook, Oreg.).—Scions received from Hungary in the spring of 1893 by the Department of Agriculture and forwarded to Mr. Hoskins for testing. Heart-shaped; of medium size; surface smooth, glossy; color light to dark crimson on yellow; dots numerous, minute, golden, indented; cavity medium in size and depth, irregular, flaring, marked by irregular walls; stem variable, $1\frac{1}{2}$ to $1\frac{3}{4}$ inches, slender, curved; suture very shallow, extending from cavity to apex; apex a whitish russet dot on a prominence at end of suture; skin thick, tenacious; stone large, long, cling; flesh yellowish, translucent, meaty, moderately juicy; sprightly, mild subacid; good to very good. Season, July 1.

Bessarabian (Benjamin Buckman, Farmingdale, Ill.).—Professor Budd, by whom the variety was introduced, says that it roots readily from scions or layers, and is most valuable on its own roots, especially when planted on dark-colored prairie

soils. Of the Morello type. It belongs to a race said to have been introduced from central Asia. Roundish oblate; of medium size; surface smooth; deep crimson; dots very minute, slightly indented; cavity small, of medium depth, regular, flaring; stem very long, very slender, curved; suture very shallow, only a line in many specimens; apex a round russet dot in a small depression; skin rather thick; stone large, roundish oval, semicling; flesh yellowish red, with light yellowish fibers about equidistant between stone and skin; flavor brisk subacid, rich; quality very good for culinary use. Season, a few days later than Early Richmond.

Heiges (C. E. Hoskins, Springbrook, Oreg.).—One of the best of Mr. Hoskins's seedling cherries. Of the bigarreau type. Heart-shaped; large; very smooth; dark purplish black; dots minute, golden, indented; cavity medium in size and depth, regular, flaring; stem short, slender; suture extending to apex, shallow, narrow; apex a round whitish russet dot in the very slight depression at end of suture; skin thin, tenacious; stone large, oval, semicling; flesh very dark purplish black, with a few light veins, meaty, tender, juicy; sweet, aromatic; quality best. Season, last of June in Yamhill County, Oreg.

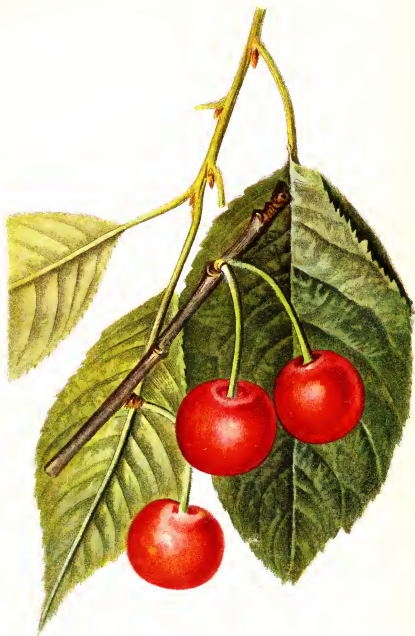
Lethe (C. E. Hoskins, Springbrook, Oreg.).—One of the seedlings obtained by Mr. Hoskins through cross pollination. Of the bigarreau type. Heart-shaped; size large; surface very smooth, glossy; color purplish black; dots minute, indented; cavity medium in size and depth, irregular, flaring, marked by irregular waves; stem very long, slender, curved; suture shallow, from cavity to apex; apex a round cupped russet dot in an acute depression; skin thin, tenacious; stone large, oval, semicling; flesh very dark purplish red, firm, meaty, juicy; mild subacid, almost sweet; very good. Season, last of June in Yamhill County, Oreg.

Occident (C. E. Hoskins, Springbrook, Oreg.).—A seedling of Napoleon. A good shipper. Heart-shaped; above medium size; smooth surface; very dark purplish red; dots numerous, minute, russet, indented; cavity large, regular, deep, flaring, marked by light shade of pink; stem $1\frac{1}{4}$ to $1\frac{1}{2}$ inches, slender; suture shallow, from cavity to apex; apex a cup-shaped light russet dot; skin thick, tenacious, not unpleasant; stone large, oval, semicling; flesh dark reddish translucent, with white veining, firm, meaty, juicy; mild subacid, rich; good to very good. Season, June 20 to July 1.

Rupp (J. Charles Heiges, York, Pa.) (Pl. III).—Grown on grounds of Solomon Rupp, at York, Pa. Foliage large, remarkably variable, affording over twenty distinct forms of leaves on some branches. Apparently a Duke. Roundish, slightly conical; very large; surface very smooth, glossy; yellowish, mottled and marbled with fine coppery red; dots minute, golden; cavity large, irregular, deep, flaring, lipped in many specimens; stem variable, $1\frac{1}{4}$ to 2 inches long, moderately stout, curved; suture from cavity to apex, shallow, raised near cavity; apex a small russet dot, elevated in some specimens and in others depressed; skin thick, tender, pleasantly acid, with a slight tinge of bitter; stone large, oblong, semicling; flesh yellowish, translucent, tinged with red, firm, juicy, having numerous white fibers through it; mild subacid, rich, sprightly; very good. Season, 20th to last of June in York County, Pa.

Schmidt Bigarreau (Charles Reisinger, York, Pa.).—A heart-shaped bigarreau; very large; smooth, glossy; dark purplish red, dots numerous, minute, yellow, indented; cavity large, regular, deep, flaring; stem $1\frac{1}{2}$ to 2 inches long, slender; suture a shallow dark purple line from cavity to apex, which is marked by a small, round, yellow russet dot in a very slight depression; skin of medium thickness, tenacious; stone large, roundish, cling; flesh yellowish white, tinged with red, very firm, meaty, juicy; sweet, vinous; very good. Season, June 15 to 25 in York County.

Sklanka (Benjamin Buckman, Farmingdale, Ill.).—A variety which is said to be doing well on the sandy lands of Poland. It is reported hardy in Iowa. Morello type. Form roundish oblate; size medium; surface smooth, though not as glossy as some other varieties; color red; dots very minute, indented; cavity medium in size and depth, regular, flaring; stem 1 inch to $1\frac{1}{4}$ inches long, of medium size, curved, located without the center of the cavity; suture shallow, extending from cavity to



apex; apex a yellowish russet dot in a narrow, shallow depression; skin moderately thick, tenacious, not bitter; stone small to medium in size, oval, bulged, free; flesh yellowish red, translucent, tender; flavor subacid; quality very good. Season, a week later than Early Richmond.

Socsany, synonym *Socsany White* (C. E. Hoskins, Springbrook, Oreg.).—Buds received from Hungary in the spring of 1893 by Department of Agriculture and forwarded to Mr. Hoskins for testing. Smaller than Baltavar, but very good in quality. Heart-shaped; small; smooth; yellow, well covered with mixed, mottled red; dots rare on surface, subcutaneous dots numerous, oblong; cavity medium in size and depth, irregular, flaring, wavy; stem $1\frac{1}{2}$ to 2 inches long, slender; suture shallow, from cavity to apex; apex a light russet dot in a slight depression; skin thick, tenacious; stone large, oblong, oval, cling; flesh yellowish, translucent, whitish veins, meaty, very juicy; sweet, rich, aromatic; very good. Season, July 1.

Striker (C. E. Hoskins, Springbrook, Oreg.).—A seedling of Napoleon. Heart-shaped; large; smooth, glossy, very similar to its parent Napoleon; yellow, washed with red on the exposed side and marbled with red over most of the surface; dots minute, russet, some of them subcutaneous, elongated; cavity wide, deep, flaring, pink; stem $1\frac{1}{4}$ to $1\frac{1}{2}$ inches long, slender; suture shallow, from cavity to apex; apex a whitish cup-shaped dot in a rather deep depression; skin thick, tender; stone of medium size, oval, semicling; flesh yellowish, translucent, with whitish veins, firm, juicy; mild, sprightly; very good. Season, June 25 to July 5.

Wabash (Samuel Kinsey, Kinsey, Ohio).—The original tree has stood on the grounds of Mrs. Ellen Pawlings, in the city of Wabash, Ind., since about 1848. It is said to bear but a few, often only one cherry at a place, but in spite of this scattering habit it is reported to be about as productive as the Richmond. Morello type. Roundish oblate; size above medium; surface smooth, glossy; bright crimson at first, turning to darker crimson; dots very small, indented; cavity large, wide, deep, flaring; stem 1 to $1\frac{1}{4}$ inches long, slender, curved; suture a shallow line from cavity to apex; apex a small yellow russet dot in a small cup-shaped depression; skin thin, tenacious; stone small, angular, free; flesh yellowish, translucent, with yellow veining, tender, melting; subacid, rich; very good. Season, about a week later than Richmond.

PEACH.

Bequett Free (T. T. Lyon, South Haven, Mich.).—Roundish oblong; size above medium; surface velvety, with short, persistent down; color creamy white, washed with dull red; dots pink; cavity large, roundish, deep, abrupt; suture from cavity to beyond apex, shallow except at apex; apex a small dot in suture; skin very thin, tender; stone large, oval, free; flesh white, stained at stone, melting; subacid, sprightly, slightly astringent; good. Flowers small; glands reniform. Season, middle of September in Van Buren County, Mich.

Berry (Allen Dodge, Washington, D. C.).—Roundish; size medium; surface velvety, with short, loose down; color creamy white, washed with red and having a beautiful crimson cheek; dots pink; cavity wide, deep, flaring; suture from cavity to apex, of medium depth; apex swollen, divided, at end of suture; skin thin, tenacious; stone small, oval, cling; flesh whitish, tinged with red at the stone, meaty, yet tender for a cling, very juicy; sweet, rich, pleasant; very good. Season, September 8 to 15 in District of Columbia.

Bishop, synonym *Bishop's Early* (Charles Wright, Seaford, Del.).—Form globular; size medium; surface velvety, with short, persistent down; color whitish, blushed and splashed with red; dots pink and russet; cavity large, deep, regular, abrupt; suture extending from cavity to beyond apex, shallow except at cavity and apex; apex a double point in the suture, depressed slightly below the general surface; skin moderately thick, tenacious; stone of medium size, oval, semicling; flesh whitish, stained at stone, tender, melting, juicy; mild subacid; good. Flowers small; glands globose. Season, last of July in Sussex County, Del.

Burke, synonym *Burke Cling* (J. W. Kerr, Denton, Md.).—Form oval; size large; surface velvety, with short, loose down; color creamy white, with a soft blush on the exposed side, and a few crimson stripes; dots pink; cavity of medium size, deep, regular, abrupt; suture extending from cavity to apex, shallow except at the ends; apex a long black point at end of the suture; skin thick, tenacious, slightly bitter; stone of medium size, oval, cling; flesh white, stained with red at the stone, firm, yet melting, very juicy; very mild subacid, almost sweet, sprightly; good. Season, August 20 to 25 in Caroline County, Md.

Donegal (H. M. Engle, Marietta, Pa.).—Roundish, large; velvety, with short, persistent down; yellow, washed and mottled with red on the exposed side; dots pink; cavity large, regular, deep, abrupt, pink; stem short, of medium caliper; suture deep at cavity and apex, extending from cavity to 1 inch beyond apex, marked by a red line in some specimens; apex a depressed dot in suture; skin thin, tenacious; stone of medium size, plump, oval, free; flesh yellow, stained with red at the stone, melting, juicy; mild, sprightly, rich; very good. Season, October 10 to 20 in Lancaster County, Pa.

Early Michigan, synonym *Husted's No. 15* (J. D. Husted, Vineyard, Ga.).—Roundish; of medium size; surface velvety, with short, persistent down; greenish white, with dark crimson blush; dots pink; cavity large, deep, regular, abrupt, marked by pink and green; stem short, stout; suture from cavity to one-half inch past apex, deep at cavity and apex; apex a small curved point in suture; skin thin, tenacious; stone medium size, oval, free; flesh greenish white, tinged red at stone, fine grained, tender; subacid; good. Flowers large; glands reniform. Season, July 5 to 10 in Spalding County, Ga.

Eureka (L. T. Sanders, Plaindealing, La.).—A seedling of Chinese Cling. Roundish; size medium; surface harsh, with rather stiff down of medium length; color pale greenish yellow, mottled and blushed with red; dots pink; cavity medium in size and depth, regular, abrupt, pink; suture deep at cavity, shallow elsewhere, extending from cavity to one-half inch past apex; apex a sharp, raised point near end of suture; skin thin, tender, slightly bitter; stone small, oval, pointed, nearly free; flesh whitish, stained, melting, juicy; mild subacid; good. Glands reniform. Season, June 15 to July 1 in Bossier Parish, La.

Francis (L. T. Sanders, Plaindealing, La.).—Prolate, oval; large; surface slightly harsh, with a short, persistent down; yellow, washed and striped with beautiful crimson; dots minute, pink; stem medium in size; suture deep from cavity to apex; apex prominent at end of suture; skin moderately thick, tenacious; stone large, irregular, oval, free; flesh yellow, stained with red at the stone, melting, juicy; subacid, sprightly; quality good. Glands globose. Season, August 10, just after Elberta.

Husted, synonym *Husted's No. 16* (J. D. Husted, Vineyard, Ga.).—Roundish; size medium; surface rather woolly; down long and loose; color greenish white, with crimson blush on exposed side; dots pink; cavity of medium size, deep, regular, abrupt, marked with red and pink; stem short, moderately stout; suture from cavity to past apex, deep at cavity and moderately deep at apex; apex a double point at or near end of suture; skin thick, tenacious; stone of medium size, oval, free; flesh greenish white, with yellow veins, fine grained, juicy; subacid; good. Flowers large; glands globose. Season, July 5 to 10 in Spalding County, Ga.

Hynes Surprise (S. D. Willard, Geneva, N. Y.).—Roundish, truncate; size medium; surface somewhat velvety, having short, loose down; color greenish white, washed, mottled, splashed, and striped with crimson; dots numerous, glistening, gray; cavity large, deep, regular, flaring; suture from cavity to apex, shallow, distinct; apex a double point at end of suture; skin thin, tenacious; stone of medium size, oval, plump, free; flesh greenish white, very slightly tinged with red at the stone, tender, melting, juicy; vinous, sprightly; good. Season, August 5 to 10 in Ontario County, N. Y.

Kent, synonym *Husted's No. 18* (J. D. Husted, Vineyard, Ga.).—Roundish; size above medium; surface rather harsh, with short, loose down; color greenish white,



D. G. Passmore.

A. Rees & Co. Lithographic.

MISS LOLA PEACH.

washed, mottled, and striped with crimson; dots pink; cavity large, deep, regular, abrupt; stem short, stout; suture from cavity to apex—beyond apex in some specimens—very deep at cavity and deep at apex; apex a point in suture extending above the general surface in some specimens, in others one-eighth inch below surface; skin thick, tender; stone of medium size, oval, nearly free; flesh greenish white, red at stone, tender yet firm, juicy; subacid; good. Glands globose. Season, July 8 to 15 in Spalding County, Ga.

Kerr Dwarf (J. W. Kerr, Denton, Md.).—The tree is semi-dwarf in habit; it is very close jointed and dense in foliage. Roundish; large; velvety; yellow, washed, mottled, and splashed with red; dots pink; down short, loose; cavity medium in size and depth, regular, abrupt, pink; suture moderately deep at its extremities in cavity and apex, shallow between them; apex a double-pointed prominence at end of suture; skin thick, tough; stone large, oval, cling; flesh yellowish, slightly stained at stone, firm, juicy; mild subacid, rich, sprightly; very good. Glands reniform. Season, September 1.

McCullister (T. T. Lyon, South Haven, Mich.).—Roundish, conical; large; surface velvety, with very short, persistent down; greenish yellow, the exposed cheek maroon, mottled with light red; dots light yellow, with dark centers; cavity of medium size, oval, deep, abrupt, marked with red and brighter red of suture; suture deep at apex, medium elsewhere; apex a fleshy prominence terminating in a sharp, dark russet point; skin thin; stone very large, oval, pointed, free, bright red; flesh yellow, juicy, free, red at stone; subacid; good to very good. Season, last of September in Van Buren County, Mich.

Minot (T. T. Lyon, South Haven, Mich.).—Oblique oval; size medium; surface velvety, with short, persistent down; color rich yellow, with crimson cheek; cavity broad, oval, deep, abrupt, marked by deep suture and slight coloring; suture medium in depth, extending from cavity to half an inch beyond apex; apex a small, greenish-russet dot, depressed; skin thick; stone large, oblique oval, free; flesh rich yellow at stone and next the skin; sprightly subacid; good. Season, September 23 to 30 in Van Buren County, Mich.

Miss Lola (Stubenrauch Fruit Company, Mexia, Tex.) (Pl. IV).—Originated and named by the senders. Roundish conical; size above medium; surface velvety, with short, loose down; color creamy white, washed and mottled with red on exposed side; dots pink; cavity large, deep, regular, abrupt; stem short, stout; suture extending from cavity to apex, deep for one-third of the distance; apex a sharp, brown point on a prominence at end of suture; skin thin; stone small, oval, free; flesh whitish, stained next the stone, tender, melting, juicy; subacid, sprightly; good. Season, July 1 in Limestone County, Tex.

Pansy (T. T. Lyon, South Haven, Mich.).—Roundish oblong, compressed; size large; surface velvety, with short, persistent down; color yellow, washed and blushed with deep red; dots pink; cavity large, deep, irregular, abrupt; suture extending from cavity to apex—beyond apex on some specimens—shallow, except at cavity and apex; apex a point on side of and near end of suture; skin thin, tenacious; stone large, oval, free; flesh yellow, tinged with red at the stone, tender, melting, very juicy; mild subacid, sprightly; good. Season, about August 20, slightly ahead of St. John.

Reed (T. T. Lyon, South Haven, Mich.).—Roundish; large; surface velvety, with short, loose down; color yellow, blushed and striped on exposed side; dots pink; cavity large, deep, regular, abrupt; suture extending from cavity to beyond apex, shallow; apex a raised point; skin thin; stone large, oval, free; flesh yellow, tinged with red at the stone, tender; mild subacid, rich; very good. Season, August 25 to 30 in Van Buren County, Mich.

Shop (E. A. Riehl, Alton, Ill.).—The tree came up near a building used for all sorts of repairs, called by the owner "shop;" hence his name for this peach. Roundish; large; surface velvety, with short, persistent down; color creamy white, with slight blush on exposed side; dots pink; cavity large, roundish, deep, abrupt; suture extending from cavity to 1 inch beyond apex, shallow except at the ends; apex a

raised double point within the suture; skin moderately thick, tender; stone of medium size, oval, free; flesh white, with yellow veins, stained at stone, very tender, melting, juicy; sweet, rich; good. Season, middle of September in Madison County, Ill.

Sneed (T. L. Wells, Dyersburg, Tenn.).—Originated about the year 1885 in the yard of Judge John L. T. Sneed, in Shelby County, Tenn. Roundish oval; size medium; velvety; greenish white, washed and indistinctly striped with crimson and purplish red; dots pink; down short; cavity medium in size and depth, narrow, abrupt, downy; stem short, slender; suture shallow, from cavity to apex; apex a small point in shallow depression; skin thin, tender; stone medium in size, oval, cling; flesh greenish white, stained with red next the skin, tender, melting, very juicy; mild subacid, very slightly bitter; good. Season, May 20 to June 1 in Dyer County, Tenn.

Stark Heath (T. T. Lyon, South Haven, Mich.).—Roundish oblong; of medium size; surface somewhat harsh, with short, persistent down; color creamy white, with a faint tinge of red on exposed side; cavity small, round, deep, abrupt; suture shallow; apex a pointed, fleshy knob, terminating in a russet dot; skin thick, tender; stone of medium size, broad, oval, cling; flesh white, firm, though very tender, juicy; acid, rich, luscious; good. Season, middle of October in Van Buren County, Mich.

Strong (T. T. Lyon, South Haven, Mich.).—Roundish; size medium to large; surface harsh, with soft, persistent down; color creamy white, washed with red on the exposed side; dots pink; cavity wide, deep, flaring, pink; suture extends from cavity three-fourths around the fruit, shallow except at cavity and apex; apex a point in suture raised to scarcely level with the surface; skin thin, tenacious; stone of medium size, oval, free; flesh creamy white, stained at stone, tender, melting, juicy; mild subacid, slightly astringent; good. Season, middle of September in Van Buren County, Mich.

Triumph (J. D. Husted, Vineyard, Ga.).—One of Mr. Husted's seedlings. Esteemed for its earliness and good carrying qualities. Flattened, globular; of medium size; slightly harsh, velvety surface; greenish yellow, washed with mixed red and marked with broken stripes of dark purplish red; dots few, pink; down short, loose; cavity wide, oval, deep, abrupt, pink; suture shallow except near cavity of some specimens, extending from cavity to apex; apex a sharp point raised above suture lobes; skin thick, leathery; stone of medium size, oval, free; flesh yellow, stained with red, firm, somewhat fibrous, juicy; mild subacid; very good. Season, June 20 in Spalding County, Ga.

Weed, synonym *Weed Barnard* (T. T. Lyon, South Haven, Mich.).—Originated on farm of George Weed, Douglas, Mich. Roundish; of medium size; velvety, with short, persistent down; color yellow, with purplish red cheek; dots minute, numerous; cavity large, oval, deep, abrupt; suture distinct from cavity to apex; apex a small russet point at end of suture; skin thin, tender, easily removed from flesh; stone of medium size, oval, pointed, free; flesh yellow, deep red at stone, soft and juicy; sweet, vinous; good. Season, September 5 to 10 in Van Buren County, Mich.

Williamson (T. T. Lyon, South Haven, Mich.).—Roundish; size medium; surface velvety, with short, loose down; yellow, washed and striped with crimson on the exposed cheek; cavity of medium size, oval, deep, abrupt; suture very shallow, extending from cavity to about one-fourth inch beyond apex; apex fleshy, prominent, terminating with russet point; skin thin, easily removed from flesh; stone large, oval, broad, pointed, free; flesh yellow, red at stone, melting, very juicy; subacid; very good. Season, last of September.

Worthen, synonym *Jennie Worthen* (T. T. Lyon, South Haven, Mich.).—Roundish conical; size medium; surface velvety, with short, loose down; color orange, with crimson spattering on exposed cheek; dots numerous, minute, crimson; cavity large, oval, deep, abrupt; suture from cavity to three-fourths of an inch beyond apex, medium depth; apex a small russet point on fleshy projection near end of suture; skin thin; stone medium in size, oval, free; flesh deep yellow, melting, very juicy; mild subacid; good. Season, August 25 to 31 in Van Buren County, Mich.

PLUM.

Arch Duke (S. D. Willard, Geneva, N. Y.).—Imported a few years since from Thomas Rivers & Son, England. Has been found thoroughly adapted to the conditions of western New York. Oval, necked; large; surface smooth; color dark blue; dots numerous, russet; bloom profuse, light blue; cavity of medium size, regular, deep, abrupt, marked by ring and bloom; stem of medium length, moderately stout; suture from cavity to past apex, shallow; apex a russet dot in suture; skin thick; stone small, oval, cling; flesh yellow, meaty, juicy; subacid; good. Season, September 5 to 10 in Ontario County, N. Y.

Biery (L. T. Sanders, Plaindealing, La.).—Grown by J. J. Biery at Covington, La., who received the tree from California labeled "Long fruit." The fruit resembles Abundance; but Mr. Sanders finds it ten days later than Abundance. Globular; size medium; surface glossy, generally smooth, but a few russet welts where fruit, when growing, was brushed by branches; yellow, blushed with red and covered with russet patches; dots minute, light russet; cavity of medium size, oval, deep, abrupt; stem short, moderately slender, enlarged at twig; suture a trace from cavity to apex; apex a russet dot slightly raised; skin thin, separates easily from the flesh; stone of medium size, oval, cling; flesh yellow, translucent, tender, very juicy; mild subacid; good. Season, July 1 in St. Tammany Parish, La.

Garnet (J. S. Breece, Fayetteville, N. C.).—Came up in the spring of 1891 under a Kelsey tree; in 1892 it bore four plums. Its characteristics indicate that it is a chance cross between Pissardi, that grew near, and the Kelsey under which it grew. Roundish oval; large; smooth; dark garnet red; dots minute, russet; bloom bluish; cavity small, regular, of medium depth, flaring, marked with blue bloom; stem short, of medium caliper; suture very shallow, almost obscure, its length from cavity to apex; apex a yellow russet dot in a very slight depression; skin thin, moderately tenacious, bitter; stone medium size, oval, cling; flesh yellowish, translucent, stained with red on one side of fruit; mild, almost sweet; good. Season, June 25 to 30.

Harney (H. C. Cook, White Salmon, Wash.).—*Prunus domestica*. Form roundish; large; moderately smooth; purplish red; dots variable, large to minute, russet; thin lilac bloom; cavity large, regular, deep, abrupt, marked with bloom; stem about one-half inch long, medium in thickness; suture shallow, its length from cavity to apex; apex a brown dot in a slight depression at end of suture; skin thin, tough; stone medium in size, roundish, nearly free; flesh pale, yellowish, translucent, with white veins, meaty, tender, juicy, somewhat salvy; sweet, rich; very good. Season, September 1.

Kicab (Benjamin Buckman, Farmingdale, Ill.).—A seedling grown by Mr. Buckman. Roundish oval; size medium; surface smooth, glossy beneath the bloom; color crimson, with deep dark purplish stripes radiating from cavity; dots numerous, variable; bloom profuse, lilac; cavity small, regular, medium in depth, cup-shaped marked by bloom; stem short-slender; suture from cavity to apex, very shallow; apex a russet dot at end of suture, this on slight prominence in some specimens; skin thick, tenacious, slightly acid; stone large, oval, cling; flesh yellowish, translucent, tender, melting, somewhat fibrous, juicy; mild subacid, almost sweet; good to very good. Season, August 10 to 15 in Sangamon County, Ill.

Lannix (J. S. Breece, Fayetteville, N. C.).—Presumably a cross of Botan and Wild, goose. As large as Wildgoose and of brighter color; much firmer and several days earlier. Tree produced its first fruit in 1895, when it was in its fourth year; its productiveness is promising. Fruit oval; medium in size; surface smooth, glossy; color coppery red, a little darker than Wildgoose; dots minute, light russet; bloom light blue; cavity medium in size, round, deep, abrupt, marked with bloom; stem short, moderately slender, slightly curved, enlarged at union with twig; suture from cavity to apex, very shallow, only a purple line; apex a russet dot on a slight prominence; skin thin, tenacious, bitter; stone large, oval, cling; flesh yellowish, translucent, tender, juicy, slightly fibrous; flavor mild subacid, rich, slightly bitter at stone; quality good. Season, June 20 to 25 in Cumberland County, N. C.

Lewis (H. C. Cook, White Salmon, Wash.).—*Prunus domestica*. Form roundish oval; large; surface smooth; color red, a little darker than Lombard; dots numerous, russet, sunken; bloom thin, pale bluish; cavity medium in size, regular, deep, abrupt, marked with bloom; stem short, moderately stout; suture from cavity to apex, shallow; apex an inconspicuous dot at end of suture; skin moderately thick, tender, slightly bitter; stone large, oval, free; flesh pale yellow, translucent, yellowish veined, meaty, tender, juicy; very mild subacid; good to very good. Season, September 1 in Klickitat County, Wash.

Marunka (T. T. Lyon, South Haven, Mich.).—*Prunus domestica*. Fruit blunt oval; size above medium; surface smooth; color dark, purplish red; dots numerous, minute, russet, indented; bloom profuse, pale blue; cavity medium in size and depth, regular, flaring, marked with bloom; stem moderately long, medium in caliper, curved, green; suture from cavity to apex, shallow; apex a russet dot at end of suture; skin moderately thick, rather tender; stone large, oval, cling; flesh yellowish, translucent, with white veins; mild subacid, rich; quality good. Season, August 1 in Van Buren County, Mich.

Monolith (J. S. Breece, Fayetteville, N. C.).—First fruited in 1893, in its third year from seed. It appears intermediate between Botan and Wildgoose. Tree upright and entirely thornless. Roundish, slightly conical, of medium size; surface smooth; bright coppery red, with longitudinal stripes of darker red; dots numerous, minute, russet; profuse pale-blue bloom; cavity medium in size and depth, very regular, round, flaring, marked with bloom; stem one-half inch long, slender; suture very shallow, indistinct except at apex, its length in a few specimens is from cavity to apex; apex a russet dot on point of fruit; skin thin, tenacious, bitter; stone of medium size, oval, semicling; flesh yellowish, translucent, melting, very juicy; mild subacid, refreshing; good. Season, July 5 to 15.

Palmer (J. S. Breece, Fayetteville, N. C.).—Probably an unmixed Botan seedling. The tree was in its third year from seed in 1895. It bore eight plums of uniform size. These fruits ripened nearly together and showed no sort of cracking. Fruit roundish conical; size medium; surface smooth; color coppery red; dots numerous, russet; bloom light blue; cavity small, regular, deep, abrupt, marked with bloom; suture from cavity to apex, shallow; apex a russet dot on point of fruit; skin thin, bitter; stone large, long oval, cling; flesh yellowish, translucent, with yellow veins, meaty, tender, juicy, somewhat fibrous; flavor mild subacid, rich; quality good to very good. Season, middle of July in Cumberland County, N. C.

Red June (Stark Brothers, Louisiana, Mo.).—*Prunus triflora*. Roundish conical; above medium in size; surface smooth, glossy; color dark coppery red, marbled with purplish red; dots numerous, minute, light colored; cavity large, regular, deep, flaring, marked with fine leather cracking; stem short, moderately stout, capped at twig; suture from cavity to apex on some, while on others the suture extends beyond the apex to about half the length of the opposite side, its depth medium; apex a small russet dot on one side of prominence in suture; skin thin, moderately tender, slightly bitter; stone small, oval, semicling; flesh pale yellowish, slightly translucent, with whitish veins, tender, juicy, melting; flavor subacid; quality good. Season, July 5 to 10 in Pike County, Mo.

Ruby (J. S. Breece, Fayetteville, N. C.).—One of Mr. Breece's seedlings; it bore its first fruit in 1894 and was then named. Form oval; size medium; surface smooth, glossy; bright crimson, with indistinct dark purplish stripes; dots numerous, minute, gray; bloom very slight; cavity small, round, deep, gradual, and abrupt; stem one-half inch long, of medium thickness, slightly curved; suture only a dark-red line from cavity to apex; apex a russet dot at end of suture, raised on some specimens; skin thick, tenacious, subacid, slightly astringent; stone large, oval, cling; flesh yellowish, translucent, with light veins, meaty, tender, slightly fibrous, juicy; sweet, rich; very good. Season, middle of July.

Scribner (J. S. Breece, Fayetteville, N. C.) (Pl. V).—A chance seedling, considered a probable cross of the Wildgoose on Botan. Fruited in its fourth year. Roundish

oval; large; smooth; bright crimson; dots numerous, minute, russet; bloom pale bluish; cavity medium in size, regular, deep, flaring, marked by bloom; stem short, slender; suture shallow, its length from cavity to apex; apex a russet dot at end of suture; skin medium in thickness, moderately tenacious, slightly bitter; stone medium in size, oval, cling; flesh yellowish, translucent, tender, melting, juicy, somewhat fibrous; mild subacid; good. Season, early July.

Sirocco (J. S. Breece, Fayetteville, N. C.).—A probable cross of Botan and Marianna. Tree bore an abundant crop in 1895, its third year from seed. Its branches grow laterally like Marianna, and the fruit has an appearance similar until it begins to color. Tree has no thorns. Roundish oval; size medium; surface smooth; coppery red under streaks of yellow; dots minute, light russet; bloom light blue; cavity small, very shallow, regular, abrupt; stem short, slender; suture a trace, deepens near apex, its length from cavity to apex; apex a dark russet, tip of pistil adherent; skin thin; stone medium in size, oval; flesh reddish yellow near the skin and yellow near the stone, fine grained, very juicy; sweet, subacid near the stone; good. Season, middle of July.

Stoddard (J. W. Kerr, Denton, Md.).—Type American. Form round; above medium in size; surface smooth, glossy; coppery red; dots minute, light russet; profuse pale-blue bloom; cavity very small, regular, very shallow, nearly flat, marked with bloom; stem short, medium in thickness, curved, enlarged at twig; suture very shallow, from cavity to apex; apex a russet dot at end of suture; skin of medium thickness, acid, slight suggestion of astringency; stone large, oval, cling; flesh yellowish, translucent, tender, fibrous near skin, juicy; subacid; good. Season, middle of August.

Truro (E. W. Tucker, Williamsfield, Ill.).—A seedling of Weaver crossed with Miner. Tree is reported upright, with good foliage and very hardy. *Prunus americana*. Form oblong oval; size large; surface smooth; color red; dots numerous, minute, russet; bloom whitish; cavity small, shallow, regular, abrupt, marked with bloom; stem medium in length, moderately slender, curved; suture from cavity to apex, shallow; apex a russet dot at end of suture; skin thin, tenacious, mildly acid, no bitterness; stone medium in size, oval, cling; flesh yellowish, translucent, yellow veins, tender, melting, juicy; mild subacid, rich; very good. Season, September 10 to 15 in Knox County, Ill.

GRAPE.

Campbell Early (George W. Campbell, Delaware, Ohio) (Pl. VI).—A seedling of Moore Early crossed with pollen of a choice seedling that resulted from a cross of Muscat-Hamburg on Belvidere. It is regarded by Mr. Campbell as the finest grape in all respects that he has produced in forty years of experimenting. Leaf large to very large, roundish, lobed, rich green, very downy beneath. Cluster large (one of a recent receipt having 113 well-ripened berries), generally shouldered, moderately compact, stem large, long, strong; berry large, nearly round, slightly elongated, adhering firmly; color black, with thin, light-blue bloom; skin thin, with slight pulpiness; flesh translucent, meaty, very tender, very juicy; flavor sweet, rich, aromatic; aroma delicate, not foxy; seeds small, 1 to 3, easily separated from the pulp and without the sharp acid found in many varieties of American origin; quality very good for both market and dessert. Season, early, ripening with Moore Early, but retaining its good qualities until quite late in season.

Clarkson (George H. Andrews, Clarkson, N. Y.).—*Vitis labrusca*. A chance seedling that first attracted attention because of its keeping qualities. Cluster of medium size, irregular and single in form, shoulder of medium proportions, moderately compact; berry round, above medium in size, adhering firmly; color amber; gloss moderate beneath thin bloom; skin of medium thickness, tender, with moderate amount of pulpiness and purple pigment; seed few, medium in size; flesh amber white, translucent, firm, tender, quite juicy; sweet, sprightly, with delicate aroma; very good. Season, a little earlier than Isabella.



ORANGE.

Ophir (Gold of) (Charles F. Lott, Oroville, Cal.).—Form roundish; size medium to large; surface somewhat rough or lumpy; color bright orange yellow; weight medium; oil cells medium to large, both raised and sunken; peel rather thin, tender, very slight adherence; tissue thin, tender; core of medium size, open; seeds medium in number, both large and small, irregular, whitish; flesh dark, translucent, orange, very tender, with long, irregular cells; juice abundant, almost transparent, quite acid, with sweetness only medium and bouquet scarcely noticeable, bitterness very slight; ripe in mid season.

Joppa (C. F. Lott, Oroville, Cal.).—A California seedling originated from seed imported from Palestine. Form roundish; size medium; surface quite smooth; color bright orange yellow; weight medium; oil cells numerous, small; peel medium to thin, tough; tissue thin; core of medium size, spongy; seeds few, small, plump, whitish; flesh pale translucent yellow, tender; its cells small, oblong; juice abundant, sprightly, sweet, with bouquet above medium; absence of bitterness. Ripe in mid season.

Lough Chong (Charles F. Lott, Oroville, Cal.).—Originated from seed out of an orange received from China about 1887 under the name "Lough Chong." The seedling varies enough from the original to warrant another varietal name. The tree is reported a good bearer. Fruit roundish, oblong; size small to medium; surface moderately smooth; color orange yellow, shading to reddish yellow on exposed side; weight above medium; oil cells medium to small, sunken; peel thin to medium, tender, slightly pungent, tenacious; tissue variable, both thick and thin; core small, open; seeds many, small; plump, light gray; flesh yellowish, translucent, tender, somewhat fibrous, with small, irregular cells; juice in moderate quantity, almost transparent, medium in both acidity and sweetness, bouquet scant though pleasant, bitterness slight. Season, moderately late.

Selecta (C. F. Lott, Oroville, Cal.).—In 1893 Hon. Oliver H. Dockery, consul-general at Rio de Janeiro, Brazil, sent five trees of this orange to the Department of Agriculture. Of these, scions and trees were distributed among 23 propagators in favorable localities. Fruit roundish, medium size; surface undulated or pitted; color deep orange yellow; weight medium or less; oil cells medium in size, prominent; peel moderately thick, lacking in pungency, rather pleasant flavored; tissue thin, tenacious; core small to medium in size, spongy; seed few, small, irregular, whitish; flesh rich orange yellow, somewhat stringy, its cells small, compact; juice abundant, transparent, sprightly, with sweetness and bouquet moderate; bitterness, a trace. Ripe in mid season.

POMELO.

Aurantium (James Mott, Orlando, Fla.).—By Florida growers this was formerly thought to be the result of a cross with sweet orange; but now a "sport" of pomelo, giving improved edible qualities, is considered as in no wise dependent upon pollen from the sweet orange. Form roundish oval; large; surface moderately smooth; color pale lemon yellow; weight medium; oil cells prominent, slightly raised and rounded; peel of medium thickness, strong, aromatic, somewhat bitter, tenacious; tissue thin, translucent; core large, spongy, partially open; seeds many, medium to large, angular, light gray; flesh whitish gray, rather tender, with large, irregular cells; juice abundant, nearly transparent; flavor: acidity¹ 7, sweetness 8, bouquet 9, bitterness 3. Season, winter.

¹ NOTE.—In a scale of 1 to 10 for acidity, sweetness, bouquet, and bitterness, 1 represents lowest and 10 highest degree.



BUD ARRANGEMENT.

Buds are differently arranged on the young wood of trees of different genera. The simplest arrangement is where buds are placed opposite; they are then 180° apart. The next simplest plan is where buds are 120° apart. This may be seen by rubbing out any bud and moving the finger upward and around the shoot; three buds will be counted before you reach one (the fourth) perpendicularly above the one removed. These two arrangements of buds are called the primary laws. Following these, other genera and species will be found that have five buds in passing upward around the shoot twice; others eight in three times, thirteen in five times, twenty-one in eight times, etc.¹

Possessed of this knowledge, it is possible to give the young tree whatever form we desire. By removing certain buds the branches resulting from the remaining ones may be made to point inward, outward, upward, or downward. The main branches of a tree may be arranged in the form of a spiral, or to form a vase—the most popular form of the dwarf pear, peach, prune, etc.

The Chinese have so thoroughly studied bud arrangement that they train trees to assume the form of quadrupeds, birds, etc. It would amply repay us to study these laws of arrangement to obtain symmetrical trees and well-colored fruits.

“Prune in summer for fruit” is often misleading. Should this pruning be delayed until what is presumed to be considered almost the close of the wood growth of the season, you may arrest the same, but should there be a continuation of warm weather until late in the fall you will find two shoots where but one grew before. Some persons fail to comprehend the proper action of the sap. It becomes “available plant food” after having passed into the leaves in order to be chemically prepared for its functions; thus fitted, it is furnished to the several buds in order. Those near the terminal bud appear to be abundantly supplied, even if those more remote must go unsupplied. We see this most plainly, perhaps, in the grapevine; the buds most distant from the roots are the first to burst in the spring and those nearest the roots are oftentimes starved and

¹ Representing the portion of the circle existing between buds in the primary arrangements by $\frac{1}{2}$ and $\frac{1}{3}$, the secondary orders can be obtained by adding the numerators to represent the number of times the shoot must be encircled to obtain the number of buds thereon, which will be found by adding the denominators, $1+1=2$ and $2+3=5$; that is, by twice encircling the shoot five buds will be found. Taking next to the last and the last of the series, $\frac{1}{3}$ and $\frac{2}{5}$, we will find that the resultants would show eight buds in passing three times around the shoot. Hence the series would assume this form: $\frac{1}{2}, \frac{1}{3}, \frac{2}{5}, \frac{3}{8}, \frac{1}{2}, \frac{2}{5}, \frac{3}{8}, \frac{4}{11}, \frac{5}{13}, \frac{6}{16}, \frac{7}{19}, \frac{8}{21}, \frac{9}{24}, \frac{10}{27}, \frac{11}{30}, \frac{12}{33}, \frac{13}{36}, \frac{14}{39}, \frac{15}{42}, \frac{16}{45}, \frac{17}{48}, \frac{18}{51}, \frac{19}{54}, \frac{20}{57}, \frac{21}{60}, \frac{22}{63}, \frac{23}{66}, \frac{24}{69}, \frac{25}{72}, \frac{26}{75}, \frac{27}{78}, \frac{28}{81}, \frac{29}{84}, \frac{30}{87}, \frac{31}{90}, \frac{32}{93}, \frac{33}{96}, \frac{34}{99}, \frac{35}{102}, \frac{36}{105}, \frac{37}{108}, \frac{38}{111}, \frac{39}{114}, \frac{40}{117}, \frac{41}{120}, \frac{42}{123}, \frac{43}{126}, \frac{44}{129}, \frac{45}{132}, \frac{46}{135}, \frac{47}{138}, \frac{48}{141}, \frac{49}{144}, \frac{50}{147}, \frac{51}{150}, \frac{52}{153}, \frac{53}{156}, \frac{54}{159}, \frac{55}{162}, \frac{56}{165}, \frac{57}{168}, \frac{58}{171}, \frac{59}{174}, \frac{60}{177}, \frac{61}{180}$, etc., in which the denominator always represents the number of buds that may be found by encircling the shoot the number of times represented by the numerator.

This law holds good from the genera of the primary arrangements through the secondary arrangements until we reach genera where the buds are crowded upon the stem and become indeterminable.

remain dormant. The long, bare arms frequently seen upon the grape trellis and the entire foliage of the wild vine often seen 40 or 50 feet from the ground exemplify the principle of sap influence.

Now, by removing a portion of the shoot before the close of the growing season, the sap will cause the development of wood growth in the buds nearest the point of pruning, and where there was but one shoot there may be two or three. An examination of the peach tree, for instance, from which budding wood has been cut will fully verify this statement.

PRINCIPLES OF PRUNING.

PRUNING—THE ACT OF TRIMMING OR REMOVING WHAT IS SUPERFLUOUS.

So many inquiries as to times and methods of pruning have been received that a statement of the general principles seems imperative.

Granting that properly grown trees have been obtained from the nursery, it is possible to properly train a tree by using the fingers and pruning knife only. Persons, however, often obtain possession of orchards the trees of which have been neglected for years, or have planted trees that have not been properly trained from the time of planting.

Under either condition the use of the saw will be necessary. An ax or hatchet should never be used, as the wound will not be as smooth as can be made with a sharp, fine-toothed saw.

It is essential that the head of the tree should be open for the free admission of air and sunlight in order that the fruit may be perfectly colored and of fine flavor. The actinic ray of sunlight is essential for this purpose and for maintaining the health of the foliage, without which perfect fruit can not be produced. Hence all limbs that cross each other which by their motion produced by the wind would abrade the bark, prevent free circulation of sap, and engender disease, must be removed.

If the trainer of the tree had a just conception of the form that the tree should assume at maturity, the removal of these limbs could have been obviated by removing the buds, which are the incipient limbs, by finger pruning or by pruning knife. A bud removed in May will render unnecessary the removal of a limb in December.

As there is a correlation between the roots and branches, it is essential that the foliage be abundant and healthful, in order that the roots may be developed and furnish nourishment from the soil for the healthful development of foliage, wood, and fruit.

It is equally necessary that the foliage be healthful and abundant, for the double purpose of obtaining food from the atmosphere and eliminating the nonessential and injurious elements furnished by the roots in the form of sap.

It is a well-known physiological fact that a weed or any other plant may be eventually killed by constantly removing the leaves as they appear. Leaves in vegetable economy perform a function very similar

to lungs in the animal economy. Hence summer pruning is to a certain extent a weakening process in the growth of the tree. This process will often induce a tree that would otherwise be possessed of a vigorous growth to produce fruit the following year.

Winter pruning, on the contrary, will produce an increased growth of wood the following season and may arrest the formation of fruit buds. Hence it is an axiom now becoming recognized that "summer pruning weakens growth, while winter pruning produces the contrary effect."

Repeated observations have established the fact that although the surface-soil may be frozen that portion in immediate contact with the roots, from the vital heat of the same, is in such a condition that food is still absorbed and distributed through the branches, ready to be converted into fruit or wood through the influence of the forthcoming foliage.

If pruning is delayed until spring, this accumulation is cut off and thrown away.

Trees often show a tendency to develop strong central shoots at the expense of the lateral ones. This can be controlled by pruning the strong shoots in summer and the weak ones in winter.

Wounds made by pruning will heal over more readily and rapidly if made when the tree is at its height of summer growth. Wounds made in the winter are exposed to the high winds of that season and of the spring also, and sap secreted for the purpose of healing the wound is lost in the atmosphere. This should be corrected by painting every wound of more than one-half inch in diameter, no matter when made.

After a thorough trial of grafting wax, shellac, clay, etc., I found nothing equal to red lead and boiled linseed oil. This will last longer, and is more resistant to water than any other mixture in general use.

Those who object to the bright-red color of this mixture can by mixing with it a small quantity of lampblack closely imitate the natural color of the bark.

Thousands of trees have come under my observation showing decay of trunks and branches through the neglect of covering the wounds with some substance impervious to water.

When it becomes necessary to remove a large limb that has become broken by high winds or the neglect to remove an excessive crop of fruit, the proper plan is to saw the limb at least two feet beyond the final point of removal, thus removing the great weight which is likely to cause the tearing of the bark upon the lower side of the limb, often extending into and down the trunk. A second cut can now be made at the proper place without any danger. When we consider the many years required for certain fruit trees to reach maturity, this precaution in pruning is a wise expenditure of time and labor.

To recapitulate:

(1) Train the tree so that only dead and injured limbs need be removed in future years.

- (2) Use the fingers and pruning knife in shaping the tree and thus save the use of the saw.
- (3) Prune weak growth in winter.
- (4) Prune strong growth in summer.
- (5) Pruning by improper methods and at improper times will prevent the formation of fruit spurs upon such trees as fruit by that method.
- (6) Never fail to protect every wound of more than one-half inch in diameter from the influence of the weather by means of paint or some other suitable material.
- (7) Study your tree thoroughly before you prune.

ROOT PRUNING FOR FRUIT.

Some trees, owing to a superabundant supply of sap, produce an excessive growth of wood. From what has been briefly stated upon the subject of wood pruning, it should be manifest to the careful reader that such trees will be to a certain extent unproductive of much fruit. Any action that will tend to decrease this exuberant flow will be likely to cause a healthy tree to set fruit buds or fruit spurs. Seeding to grass may be resorted to for that purpose, as the grass will consume much of the fertility of the soil. The cultivation of summer crops that draw upon the supply of fertility during the growing season of the trees has often proved successful. Withholding fertility in the form of manures and fertilizers has often been resorted to with marked success, but root pruning seems best adapted of all the means suggested to meet the requirements of the case. It has frequently been observed that when trees have been injured, as by partial girdling by rabbits or mice, that such trees have been rendered fruitful within a year or two, although they may have been injured to such an extent as to die a year or two after having produced one or two crops of fruit. The limb of a cherry tree partially broken from the main stem, thus cutting off the full supply of sap, will blossom and often set fruit the same year that it matured a crop of fruit at the proper season.

Apple trees during a season of excessive drought often bloom in late summer or early fall.

Second-crop crab apples have frequently been exhibited at certain fall fairs as great curiosities. A careful investigation has in every case shown that these trees died within three years of producing the second crop of the season.

These are but a few cases of many that might be cited to show that whatever retarded an excessive supply of sap that from the condition of growth of the tree would naturally have produced wood will in almost all cases "throw the tree into fruiting."

This result can be obtained by digging a trench around the tree the width of a spade at a distance depending upon the size of the tree, by which many of the fine feeding roots may be severed from the tree. The soil should be thrown back into the trench upon completion of the operation.

A case that came under my observation will fully exemplify the efficacy of this method. A friend, an enthusiast in strawberry culture, was the owner of a fine Saratoga plum tree that had been planted perhaps five years. It was sufficiently large to have produced fruit, but, growing luxuriantly, it had never blossomed. He was about to cut it down and offered it to me if I would remove it, he objecting to the shade, as he wished to plant that portion of his ground to strawberries.

The tree was carefully removed, although many fibrous roots were lost. It was planted, and the ground was heavily mulched and kept moist during the summer. Little growth of new wood was made, but fruit buds appeared in great abundance. The next year this tree produced a bountiful crop of fruit.

The luxuriant growth of wood was arrested by root pruning and transplanting, and a crop of fruit has been gathered annually.

CLOSE ROOT PRUNING WHEN PLANTING TREES.

As many inquiries relating to close root pruning at time of setting out trees have been received at this division, it is deemed expedient to refer to this matter in the present report.

This method has proven successful in the South, so far as we have learned, but as yet no reports have been received of any extended or extensive trials in the North.

The natural conditions of these two sections differ materially and modify to some extent our present plans of operation. It is a well-known fact that certain species of fruit trees can be easily propagated from cuttings in the warm soil and climate of the South that can only be propagated in the North by budding and grafting. Apple and pear cuttings root readily in the South and thus form trees true to variety.

A brief description of the means used in greenhouses to propagate plants may enable us to comprehend how "callusing" and "rooting" are accomplished there. "Bottom heat," either by hot air, hot water, or steam circulating beneath the propagating benches, causes cuttings to strike root in a comparatively short time.

Even leaves, portions of leaves, and the "veins" of leaves are used for the purpose of multiplying plants.

The propagator, however, is careful that the superincumbent air is kept at a lower temperature than the soil on the benches, heated by the means above mentioned. He is therefore provided with ample means for thorough ventilation.

These conditions, to a certain extent, naturally exist in sections having a warm climate, especially where the soil is of a sandy character. During the night the air becomes much cooler than the soil and thus brings about a relation of "bottom heat" and cool superincumbent air. The almost unendurable heat of the day experienced by the traveler in crossing a tropical desert is followed by nights so cool that woolen blankets are needed to protect him.

Hence it may be adduced that certain physical conditions may exist

in one section of a country rendering practical certain methods in horticultural operations that would be partially or entirely impracticable in another.

Again, the soil in the northern portion of our country is not sufficiently warmed by solar influences for rapid root growth at that time of spring when tree planting is most generally done. This question of latitude, other conditions being the same, is one of such moment that in one State at least two "arbor days" are provided for by the school department—one for the northern portion of the State and one for the southern.

Should this method of close root pruning prove practicable throughout the greater portion of our country it would be of inestimable value, as trees could be pruned at the nursery, packed in much smaller bundles, and be transplanted at much less expense. The experiment stations of the several States possess all the means of conducting a series of experiments along these lines that could determine this matter, not only as to its advantages or disadvantages, but by experimenting on all species of fruit trees, as to which, if any, this method of pruning should not be applied.

It need scarcely be suggested that this series of experiments can not be performed at any one station, as the greater variety of soil, different climatic conditions, widest range of latitude, and different altitudes constitute the only basis upon which can be established its general usefulness.

CHINESE PERSIMMONS.

Having learned of the existence of persimmons in China, said to be more hardy than the Japanese varieties, the Secretary of Agriculture requested the Secretary of State to obtain through the consular service scions of the same for distribution in sections where stock of the American varieties might be found for the purpose of grafting the Chinese varieties upon them. Hon. Charles Denby, United States minister to China, accordingly obtained and sent to the Department of Agriculture a liberal supply of scions, which unfortunately were dead upon arrival.

Accompanying the scions were several hundred seeds, which were placed under the care of Mr. William Saunders, horticulturist of the Department of Agriculture. About three hundred trees were grown from these seeds, which will be distributed among the several experiment stations and individuals interested in the improvement of this fruit in the States in which the native persimmon is indigenous.

While many of these seedlings may prove worthless, it is to be hoped that some may prove superior to any variety that we now have, and by a proper distribution of scions of the same the persimmon-growing section may soon be supplied with them.

Instructions relating to a more careful packing of the scions will be sent to Minister Denby, and another attempt will be made to obtain them in a proper condition.

In foliage and habit of growth these persimmons are somewhat similar to the American varieties, and to test their hardiness several trees were planted upon the experimental grounds of the Department of Agriculture before deciding to which sections the trees propagated from the seeds obtained from China should be sent. Considering that they were germinated under glass and grown in artificial heat, the planting in open ground late in October should prove a crucial test for a winter climate no more severe than that of Washington, D. C., in 1895-96.

THE ALMOND IN SOUTHWEST UTAH AND SOUTHEAST NEVADA.

By THOMAS JUDD, of Utah.

The almond, a native of North Africa and Asia, has always been extensively cultivated in southern Europe, and thence in years past largely imported into the United States. While attempts have been made to produce the almond in this country east of the Rocky Mountains, they have met with poor success except in Florida. Efforts to secure a crop have been made in the Mississippi Valley, but it has been found that the fruit dropped from the trees before maturity. It is supposed that this result is caused by the atmosphere being surcharged with moisture.¹

California has of late years increased its production of this valuable addition to the nut supply of our nation; and a part of southern Nevada, extreme southern parts of Utah, and portions of New Mexico and Arizona appear to be also well adapted to the successful production of the almond, a dry atmosphere in connection with irrigation being just what is necessary to make this a profitable industry.

A warm, dry soil is most suitable to the successful production of the almond, which is cultivated like the peach and is subject to the same diseases. The almond may be budded on peach or plum stocks.

Observation of these facts has led me to invest and to encourage others to invest considerable capital in almond culture in southern Utah and southeastern Nevada.

I have been making experiments for the past ten years in St. George, Washington County, Utah, and for half that time at La Verkin ranch, near Toquerville, in the same county; also at St. Thomas, Lincoln County, Nev. The results have been quite encouraging.

Most of our almond trees are raised from the seed in St. George, and give different types of the *dulcis*, or sweet almond; some are exceedingly fine, and will favorably compare with the best in the world. In St. George we have a seedling called the "Gray," named for its owner; it is one of the large, soft-shell type, and the original tree, though but

¹ The failure of the almond to produce crops in the lower Mississippi Valley and South Atlantic States where the trees thrive is believed to be chiefly due to the fact that the blossoms open very early in spring and are destroyed by late frosts.—(S. B. H.)

of medium size, has borne regularly for the past ten years not less than 40 pounds and as high as 57 pounds annually.

Three years ago I planted on the ranch of Woolley, Lund & Judd, at St. Thomas, Nev., 100 acres of seedling almond trees. Some are bearing this year, and many of them are full of fruit buds and very promising for next year. Two years ago I added 25 acres more. I have also planted 40 acres of almond trees at La Verkin ranch, southern Utah, which will begin to bear the coming year (1895).

Two years ago I sent a sample of our St. George (Utah) almonds, at his request, to Hon. H. E. Van Deman, at that time Pomologist of the Department of Agriculture, Washington, D. C. After examination he kindly suggested that we send to A. T. Hatch, of California, and get some of his best varieties to bud to our seedlings. Mr. Van Deman stated that the kind I had forwarded him might be profitable to grow, but Mr. Hatch's varieties would be still more so. In accordance with the suggestion, I sent, and am now propagating the I X L, Ne Plus Ultra, and Nonpareil. None of these are bearing yet, but I am satisfied they are very fine and, from reliable information at hand, are far superior to those imported.

The Tarragona is the leading and best-known variety sold in the United States; this is largely imported from Spain, and can be taken as a standard. The ratios of shell to kernel, expressed in ounces, in this and the improved varieties are, per pound:

Variety.	Shell.	Kernel.
	Ounces.	Ounces.
Tarragona.....	9.60	6.40
I X L.....	7.00	9.00
Ne Plus Ultra.....	6.00	10.00
Nonpareil.....	5.00	11.00

In planting out young trees we cut them low, so as to branch out about 18 inches from the ground. A low head is profitable for several reasons, among them being that the nuts are easier to gather, that the trunk of the tree is better protected from the sun, and that the ground after irrigation retains its moisture longer.

The almond requires but little pruning, especially after bearing a good crop or two (the growth of the wood after that is usually sufficient to produce fruit buds for each year), to insure a good crop.

In irrigating, care should be used to keep the water from the trunk of the tree. To guard against this it is advisable to ridge the soil against the young tree the first year, running the water about a foot from the tree; the second year nearly the same, and the third year at least two feet from the trunk. Irrigation should not be too copious and water must not be allowed to "pond" near the trees. Observation has taught me that more trees are lost from the last-named causes than from all the others; especially is this the case in clay soils.

The almond usually blooms with us about a week before the apricot. In 1894 its blossoms began to show at St. Thomas, Nev., on the 21st of February, and at St. George, Utah, about ten days later.

The temperature of St. George and La Verkin, Utah, is about the same; but it is somewhat increased at St. Thomas, Nev.

In gathering the crop we clear the ground from weeds, spread a soft cotton covering under the tree, and strike the limbs smartly with a cane or stick, being careful not to bruise the bark or break the small twigs; a slight covering of cloth around the end of the stick will aid in preventing bruises of the bark. Our harvest time is about the middle of August. The nut should not be left on the trees to become hard and dry; yet should be fully matured before gathering. Where needed, a little sulphur may be used to bleach the nuts, thus adding to their appearance for marketing. I have found that in putting out young orchards it is much better to plant and cultivate some annual, low-growing crop between the rows of trees. I would suggest that this supplemental crop should be such as would not draw heavily upon the soil. I have planted cotton and found it a decided advantage, for the trees thus treated have made double the growth of those in rows not planted with supplemental crop. In conclusion I would state that to anyone interested in almond culture it is a matter of a few minutes to figure the financial returns. I have planted my trees usually about 16 feet apart each way, making 170 per acre. My 8-year-old and 10-year old trees average, at a very low estimate, say, 15 pounds each. This average gives 2,550 pounds, which, at 7 cents, yield \$178.50; irrigation, cultivation, etc., per acre, \$30; gathering, sacking, etc., 1½ cents, \$38.25; marketing, etc., at 1 cent, \$25.50; total, \$93.75; profit, \$84.75 per acre. This is a profit of 10 per cent on investment of \$847.50.

SMALL-FRUIT CULTURE.

By JAMES B. GILCHRIST.

During the twenty-four years in which I have been engaged in fruit culture in central Delaware a careful account has been kept of each crop, showing each day's shipment, price received, harvesting and shipping expenses, and net amount received for crop. To these records notes and suggestions were added during the season from experience and observation which were thought might be of value in the future. In the following paper I have selected from these records and notes such information as perhaps may be helpful to those engaged in small-fruit culture, of which only the following have been grown by me for market, viz, strawberries, blackcap raspberries, red raspberries, and blackberries.

STRAWBERRIES.

Previous to moving south to Delaware I had but little experience in fruit culture. Among other fruits put out in the garden in the spring of 1870 were a few hundred Wilson Albany strawberry plants. Under

good garden care these yielded at the rate of 5,000 quarts to the acre, which, at the net price received for those shipped, would be \$500, an amount from 20 to 30 times greater than could be obtained from ordinary farm crops. In the spring of 1871, 5,000 Wilson Albany plants had been set 3 feet by 14 inches, occupying not quite half an acre. The ground had been in potatoes the previous year. After the plants were set five loads of fine manure were spread broadcast. After the middle of July all runners were allowed to grow, and pains were taken to spread them out, so that in the fall the ground was entirely covered with plants. Twenty thousand were used in the spring to extend the berry field to two acres and 30,000 were sold.

The following is a condensed record of the next sixteen years:

Year.	Acres.	Quarts.	Net per quart.	Net receipts.
1872.....	1 $\frac{1}{2}$	1,000	\$.09	\$90.00
1873.....	2	5,075	.08	406.00
1874.....	2	6,600	.06	396.00
1875.....	2 $\frac{1}{2}$	6,539	.05	326.95
1876.....	3	5,292	.02 $\frac{3}{4}$	140.00
1877.....	2	2,745	.02	54.35
1878.....	2 $\frac{1}{2}$	3,850	.03 $\frac{1}{2}$	124.09
1879.....	1 $\frac{3}{4}$	3,356	.05 $\frac{3}{4}$	195.55
1880.....	2 $\frac{1}{2}$	3,527	.07 $\frac{3}{4}$	278.35
1881.....	3	5,530	.01 $\frac{3}{4}$	89.05
1882.....	3	5,803	.04	223.19
1883.....	1 $\frac{1}{2}$	1,902	.02	38.04
1884.....	1 $\frac{1}{4}$	3,154	.04	127.55
1885.....	1	2,417	.04 $\frac{1}{2}$	103.48
1886.....	1 $\frac{1}{2}$	2,223	.02 $\frac{3}{4}$	52.51
Total receipts from fruit.....				\$2,701.23
Two hundred and forty-one thousand plants used and sold.....				447.75
Total net ¹ receipts.....				3,149.03
Average net for sixteen years per acre.....				100.04
Average net per quart.....				.5 $\frac{1}{2}$

¹ By net is meant what is left after picking and shipping expenses are taken out.

SOIL.

The soil on which these berries were grown was of all grades, from a light sand to a heavy clay. Neither of these extremes is desirable. The former costs too much to bring and keep up to the necessary fertility for a paying crop, and the latter does not admit of timely cultivation nor stand drought well. All things considered, a somewhat heavy clay loam is most suitable.

PLANTING.

As early in the spring as the ground is in suitable condition is preferable. During the first ten years the plants were kept set 3 feet by 14 inches, and kept in hills. Since then they have been set 4 feet by 18 inches, and allowed to form a matted row from 2 feet to 2 $\frac{1}{2}$ feet wide. Hill culture will perhaps yield somewhat larger berries, but matted row culture saves nearly one-third the plants in setting and requires less cultivation and produces more abundantly.

MANURING.

Barnyard manure has been the chief dependence, and for many years was thought indispensable. The good crops of 1873 and 1874 were due largely, first, to a good, suitable soil; second, to an abundance of manure before the plants were set; third, to a heavy mulch of long manure each winter, which was allowed to remain until after the berries were picked.

Good success was obtained from the one acre in 1884 and 1885 by the use of fertilizers alone. Without help this plot would not have yielded more than 25 bushels of corn. About 1,800 pounds of ordinary No. 1 superphosphate were used on the corn crop the previous year and 70 bushels of unleached wood ashes on the row when plants were set.

CULTIVATION.

Cultivation is as necessary as manure in the profitable production of this crop. Here is where so many fail. Weeds are robbers and must be kept out. A constant stirring of the soil not only destroys these enemies, but gives strength and vigor to the plants, causing them to send out their roots wide and deep, to gather food for larger growth and fruitfulness.

MULCHING.

Mulching has become a necessity. During the first few years of my experience with strawberries even poor, dirty fruit would sell at remunerative prices. Since then only good, clean fruit will pay. Though mulching seems expensive, yet the higher price received for a single shipment will oftentimes more than return the outlay.

At the average receipts for the sixteen years, were strawberries a profitable crop? The following estimate of the cost of an acre for manuring, plants, planting, cultivation, mulching for three years—the profitable duration of a strawberry field—will answer this question:

FIRST YEAR.

To 25 loads of manure at \$1	\$25.00
To drawing and spreading	5.00
To plowing and harrowing	2.00
To 12,000 plants, at \$1.50 per 1,000, and setting	27.00
To cultivating and hoeing for the season	15.00
To cultivating and hoeing in spring	3.50
To mulching	10.00
To interest on land, value \$50	3.00
Outlay for year	90.50

SECOND YEAR.

To taking off mulch.	\$2.50
To cultivating and hoeing for the season	2.00
To cultivating and hoeing in the spring	3.50
To mulching	6.00
To interest on land	3.00
Outlay for year	27.00

THIRD YEAR.

To taking off mulch.....	\$2.50
To manure, ashes, or phosphate.....	12.00
To cultivating and hoeing in spring.....	3.50
To cultivating and hoeing in season.....	12.00
To mulching.....	6.00
To interest on land.....	3.00
Outlay for year.....	39.00
Three years' receipts, average \$100	300.00
Three years' outlay.....	156.50
Three years' profit, net	143.50
Net profit per acre per year.....	47.83

Add to this the value of the mulch left over, the increased fertility of the soil from continued thorough culture, and the manure, ashes, etc., remaining unused in the ground, this average will be increased to \$50 per acre.

Will strawberries pay at present prices, say, at 3 cents net per quart? Yes, if large enough crops are raised. From recent experience I am satisfied that the average yield need not be less than 4,000 quarts per acre, and in favorable seasons much greater. In 1894 from 27 square rods of ground 1,100 quarts were picked. This was at the rate of 6,500 quarts per acre. About an equal part of these plants were one, two, and three years old. Had they all been in the first year, doubtless the yield would have been larger still. Were I again to engage in field culture of the strawberry, I would select a good dry clay loam which had been in clover or grass for two or three years, and would spread ten to twenty loads of good barnyard manure on the sod and turn it under in the fall. The next season I would plant it to some good crop, like round potatoes, which could be tilled the entire season, using a ton of good phosphate, half broadcast and the rest in drill. The following spring I would prepare the ground as soon as it was in suitable condition to work and plant the following varieties: Michel Early, Jessie, Bubach, and Gandy, 4 feet by 18 inches. Soon after I would spread 100 bushels of good unleached ashes broadcast to the acre. In about three weeks after setting I would run a harrow-toothed cultivator through, and again about a week later, when they should be hoed.

During the season I would cultivate them at least once a fortnight until September and hoe as often as necessary to keep them clean. I would cut off all the bloom and keep off all runners until the middle of August, after which all would be allowed to grow, care being taken while hoeing to spread them out so that uniform matted rows would be formed. In the spring I would reduce the width of the rows to from 2 feet to 2½ feet, according to thrift of plants, and would keep the spaces between well cultivated until the berries were about half grown. Then I would apply some fine material like sawdust, which is excellent, heavily on the row, working it carefully down

between and around the plants. After the berry harvest I would reduce the width of the rows to about a foot and apply ten loads of fine manure, or half a ton of truck phosphate, per acre on the row and cultivate and hoe thoroughly, as in the first year, and keep off all runners until the first of September, when they would be again allowed to spread out and form a matted row as before. The second spring they would be treated as in the first. After the second harvest I would take them out. With such preparation and treatment I would confidently expect an average crop of not less than 4,000 quarts per acre.

BLACK-CAP RASPBERRIES.

My experience with this crop commenced in the fall of 1872, when 1,750 Doolittle plants were set 8 feet by 3 feet on an acre which had been in grass for several years. A forkful of long manure was put on each hill during the winter. The following spring a row of strawberry plants was set between each row of raspberries.

In the spring of 1874 the laterals were trimmed to about 10 inches in length and the new growth was tipped to about a foot in height. About the 1st of September the new lateral growth was covered by a furrow thrown toward the row. The result was 6,600 fine plants. The laterals were again covered the following year, and 16,700 plants was the outcome. The strawberries were left in three years. The following is a condensed statement of the net receipts from this acre for six years:

4,482 quarts of raspberries, net.....	\$273. 59
3,539 quarts of strawberries, net	177. 00
29,000 raspberry plants, net	144. 00
21,000 strawberry plants, net.....	36. 75
Total	601. 34

In the fall of 1874 six acres more were set in an apple orchard. This ground was equally as fertile and received as good cultivation and care, yet from unfavorable seasons and blight the average yield was but little more than half that of one acre. The total net receipts from berries and plants for five years and from crops grown between the rows the first two years were \$1,051.30, an annual average of about \$35 an acre. In 1880, 3½ acres more were set, but from a bad stand, unsuitable soil, and blight they were almost a total failure. Altogether this crop has not been satisfactory. It would seem to have many advantages over the strawberry, being less expensive to plant, lasts longer, and requires less labor to till, but the cost of picking and shipping is much greater, and the average yield does not exceed one-third. The great obstacle, though, in the profitable production of this crop is the dying of the canes after the second year. This is generally called winter-killing, but it is wrongly named. The bushes from which the crop of 1885 was taken were dead to the ground before frost came, and were taken out

that fall. If a raspberry field be examined after the second or third crop, it will be found that this blight (?) commences on the tip end of the branches and proceeds gradually toward the center stalk, or cane, during the winter and spring. Sometimes there is life enough left at harvest time to produce a fair crop of fruit, but often only a few clusters mature and the rest wither and dry up on the bushes. There seems to be no reliable remedy. Good, heavy, clay loam, plenty of manure, and thorough cultivation will retard the effect and progress of this disease, but will not cure it.

RED RASPBERRIES.

But little space need be given in this paper to this crop. Six years' careful trial of several varieties convinced me that this fruit could be grown on my farm only at a loss. Five different varieties have been tested, viz, Philadelphia, Highland Hardy, Brandywine, Hansel, and Marlboro. The Philadelphia proved most excellent for home use, being large, productive, and of delicious quality, but too tender to carry even to the nearest market. The Highland Hardy may have been a good berry, but unfortunately there was no opportunity to judge of its merits. Every winter the canes died to the ground. After cultivating, manuring, pruning, etc., for three years with scarcely a berry in return, they were taken out in disgust.

The Brandywine had some good points, being vigorous, hardy, and fairly productive for a red raspberry, but was lacking in two essential qualities—size and earliness. The Hansel was the best in the above-named list of varieties, being very early, large, productive, and firm. Its greatest fault was its slow, weak growth. The Marlboro canes, like the Highland Hardy, died each winter to the ground and were taken out the second year.

BLACKBERRIES.

My experience with blackberries commenced in the fall of 1873, when 2,500 Wilson Early plants were set in $1\frac{1}{2}$ acres. This plot had been in corn that season and for several years before in clover. Each hill was covered with a forkful of long manure as soon as set. In 1878 an increase was made of 1 acre, and more and more from year to year until 1891, when in all there were about 15 acres. Strawberries were set between the rows of the first 5 acres, from which three crops were taken. Between those set later a row of round potatoes was planted the first year, and nothing after that. Of these, $1\frac{1}{2}$ acres were set in 1881 with early peach trees, 18 feet apart, a row of berry plants being set with the row of trees and one between. This has been a fruitful piece of ground. The peach trees have borne good crops two years in three, on an average, and the blackberries have yielded much better than any similar area of ground outside. In 1889, $4\frac{1}{2}$ acres more were set with late peach trees. These have borne every year since. Nearly all the crop of 1894

was taken from these bushes. The following table gives the number of acres, yield, net price per quart, and net receipts for twenty years:

Year.	Acres.	Quarts.	Net per quart.	Net receipts.
1875.....	1 $\frac{1}{2}$	1,051	\$0.06 $\frac{1}{2}$	\$69.88
1876.....	1 $\frac{1}{2}$	1,472	.05 $\frac{1}{2}$	76.45
1877.....	1 $\frac{1}{2}$	2,205	.06 $\frac{1}{2}$	149.94
1878.....	2 $\frac{1}{2}$	6,065	.05 $\frac{1}{2}$	338.54
1879.....	3 $\frac{1}{2}$	5,360	.06	320.03
1880.....	3 $\frac{1}{2}$	5,360	.06	234.94
1881.....	4	4,145	.08 $\frac{1}{2}$	343.14
1882.....	5	10,038	.04 $\frac{1}{2}$	425.34
1883.....	5	8,904	.05 $\frac{1}{2}$	456.62
1884.....	5	11,601	.04 $\frac{1}{2}$	521.00
1885.....	5	11,711	.04 $\frac{1}{2}$	520.70
1886.....	8	16,021	.02 $\frac{1}{2}$	383.48
1887.....	8	3,453	.02 $\frac{1}{2}$	190.62
1888.....	8 $\frac{1}{2}$	19,058	.03	584.22
1889.....	9 $\frac{1}{2}$	11,524	.02 $\frac{1}{2}$	295.80
1890.....	10	13,323	.04 $\frac{1}{2}$	620.43
1891.....	14	9,287	.05	468.58
1892.....	15	7,368	.07	523.57
1893.....	12	2,032	.08	164.15
1894.....	12	18,545	.04	720.15

Average, net, per quart..... \$0.04 $\frac{1}{2}$
 Average annual yield per acre..... quarts... 1,317
 Average annual receipts per acre..... \$57.80

In 1886 1 acre of Early Harvest blackberries were set 6 feet by 3 feet, and this area has been extended, until now there are in all 5 acres.

The following table shows the acreage, yield, etc., for seven years:

Year.	Acres.	Quarts.	Net per quart.	Net receipts.
1888.....	1	2,678	\$0.04	\$108.20
1889.....	1	2,796	.01 $\frac{1}{2}$	40.79
1890.....	1 $\frac{1}{2}$	2,540	.06	152.60
1891.....	2 $\frac{1}{2}$	4,432	.04 $\frac{1}{2}$	195.75
1892.....	2 $\frac{1}{2}$	3,274	.05 $\frac{1}{2}$	183.72
1893.....	3 $\frac{1}{2}$	5,398	.05 $\frac{1}{2}$	313.22
1894.....	4 $\frac{1}{2}$	4,271	.03 $\frac{1}{10}$	133.38
Total.....		25,389		1,132.85

Average, net, per quart..... \$0.04 $\frac{1}{2}$
 Average annual yield per acre..... quarts.... 1,560
 Average annual receipts per acre..... \$69.57

The Early Harvest comes into full bearing the second year. Blight was first observed in spots in 1889, and grew worse each year, but did not materially affect the yield until 1892, when the crop was shortened nearly one-fourth. The crop of 1893 was harvested from about one-half of the 3 $\frac{1}{2}$ acres in bearing that year. Blight and frost killed the older half of the plantation.

SOIL.

The soil on which these blackberries have been grown varies from a sand loam to a heavy clay. The former is greatly to be preferred. A light soil is more easily tilled; the growth of the cane is more vigorous and healthy; the bushes are more productive, and the fruit is of better size and quality.

VARIETIES.

Only the two above named have been grown for market. The Lawton has been grown in the garden and is most excellent for home use, but too late for profitable shipping.

The Wilson Junior, Erie, and Minnewaska have been tried by careful fruit growers in the neighborhood, and have proven undesirable for market.

PLANTING.

At first good success was had by setting the plants late in the fall with a forkful of manure on each hill; but later it was found that the cutworms would gather in the manure in the early spring and cut off the new shoot before it reached the top of the ground. Sometimes it would start again, but was usually very feeble. Excellent success has been obtained in late years by digging the plants in the fall and heeling them in until the spring and, when set early, puddling with a stiff mixture of barnyard wash and clay.

TRIMMING.

The old wood has usually been taken out during the winter, as it is then brittle, breaking easily, especially when the ground is frozen. Generally the laterals have been trimmed during January and February. Sometimes, as an experiment, a part has been trimmed in the fall, a part in the winter, and the rest in the spring. As a rule, early trimming has given best results. The young canes have been topped when about 15 inches high. This makes a low and stocky bush.

CULTIVATION.

Thorough culture the entire season is a necessity with this crop. During the first years the plow was used in part, the earth being thrown toward the row late in the season and thrown away again the following spring. I am well satisfied that the use of the plow is injurious. Even with the greatest care it goes too deep. After the ground has been mellowed in the spring by a horse duck-bill cultivator, a two-horse cultivator is used the balance of the season. Where rows are about 8 feet apart in width, a round between each row once in ten days or two weeks will keep the ground in splendid condition. Where they are closer—as the Early Harvest—a one-horse fluke cultivator is used throughout the season. Usually they have been hoed twice, the first time in April and again in June. A later hoeing is sometimes given in August, and is a necessity in keeping the bushes as clean as they ought to be. The prevailing opinion that weeds and grass are a protection from blight and frost is a great mistake.

I am well aware that the results set forth in the preceding pages will not compare favorably with the oft-reported immense crops of some new variety. The above is a record of a long term of years, and has been exceedingly satisfactory. No estimate has been made of the cost of growing these berries, but I am confident that the average annual expense of plants, cultivation, including interest on land, will not exceed \$20 per acre. This leaves a clear annual profit per acre, over every expense, of \$37.80 for the Wilson and \$49.57 for the Early Harvest.

